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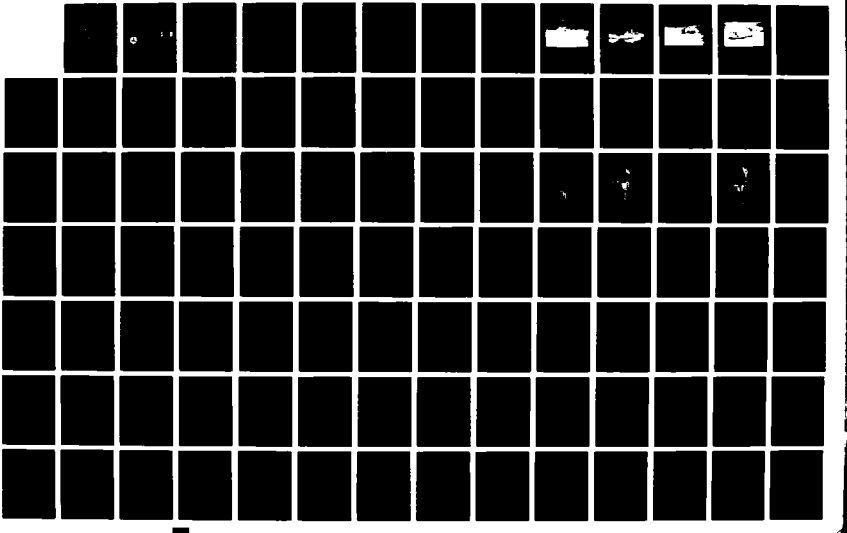

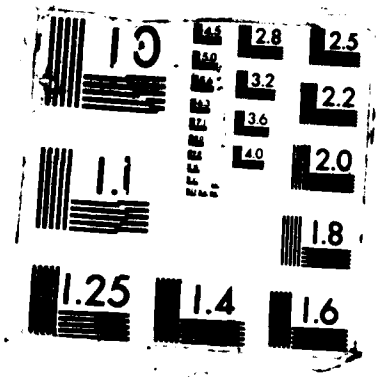
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Report No. CG-D-18-87

U.S. COAST GUARD BUOY TENDERS: HISTORICAL AND PROJECTED USAGE

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16. Abstract

The U.S. Coast Guard presently operates 28 offshore buoy tenders and 12 coastal buoy tenders. These vessels are coming to the end of their service life and a capability replacement program has been initiated. This report identifies the capabilities provided by the current fleet by summarizing the employment history over the last five years. Projections for future buoy tender usage are also presented.

The coastal buoy tenders have spent nearly 87% of their time servicing aids to navigation over the last five years. The balance of their time was spent supporting other missions such as search and rescue, law enforcement, training and other miscellaneous missions. Offshore buoy tenders have been used as multi-mission platforms, spending about 56% of their time servicing aids to navigation, 13% on search and rescue, 9% on law enforcement and 7% on training. The offshore tenders also are engaged to a lesser degree in military operations, icebreaking and a variety of miscellaneous missions.

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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	* 2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	*m*
mi	*miles*	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (WEIGHT)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (EXACT)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures. Price $2.25. SD Catalog No. C13.10.286.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (WEIGHT)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	0.125	cups	c
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (EXACT)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

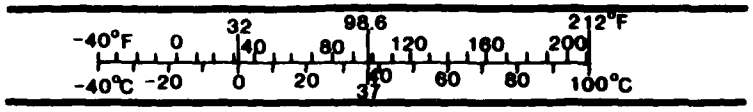


TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

1.0 ADMINISTRATIVE INFORMATION

The information in this report was developed for task element 9207.1 (Acquistion Support) of the U.S. Coast Guard's Marine Vehicle Technology (MVT) program. The MVT program was directed by the Marine Vehicle Technology Branch (G-DMT-2) of the former Office of Research and Development in Washington, D.C. The Acquisition Support element of the project is designed to assist managers of operational Coast Guard programs and project managers in the Office of Acquisition. The Office of Management and Budget (OMB) Circular A-109 requires all Federal agencies to follow set procedures in major systems acquisition. Vessel replacement is not done on a one-for-one basis. All alternatives must be explored for replacing the capability of the present fleet. Part of that process is to identify trends and project usage and changes in the system. This is only one step in that process. This effort was requested by the project manager, prior to the establishment of the Office of Acquisition, to support the future procurement of a ship system to replace the present WLBs and WLMs.

2.0 BACKGROUND

The Coast Guard presently operates 40 offshore (WLB) and coastal (WLM) buoy tenders to service aids to navigation in the littoral region of the United States. A list of these tenders, profile drawings and their general characteristics may be found in Appendix A. The ocean-going buoy tenders (WLBs) were all built in the period from 1942 to 1944. As they approached the end of their projected service life in the 1970's, the Austere Renovation Program was implemented. This was intended to extend the service life of 14 WLBs for 7 to 10 years. Subsequently, another 14 WLBs underwent a major renovation to extend their service life 15 to 20 years. The intent was to begin replacing the renovated cutters by the time they reached the end of the new service life. However, the ship system replacement program was not in effect by this time. In order to further extend the

lifetime of the cutters, the Service Life Extension Program (SLEP) was instituted in the early 1980's. To date, four cutters have completed the SLEP. Two WLBs are currently in the shipyard, with completion expected in 1989. A typical WLB is shown in Figure 1.

The coastal tenders (WLMs) are comprised of three classes of ships. The FIR (which was built in 1939) is the only remaining vessel of the 175' class which is operating. The 133' class currently consists of six operational vessels. They were all built in the 1942-1944 era. The five 157' WLMs are the most modern of the coastal and offshore buoy tenders. They were built between 1964 and 1971. These vessels are illustrated in Figures 2, 3 and 4.

Buoy tenders are work vessels which are subjected to abuses of various degrees. They frequently come in contact with large steel buoys and hard-mounted structures. The majority of their operations are in shallow water where they are subjected to groundings on a regular basis. It is not surprising that many of them will be coming to the end of their new service life by the end of the 1980's and early 1990's.

None of the operational people in the Districts and Headquarters who were interviewed for this report anticipated any significant technological changes in the Aids to Navigation (ATON) system. They pointed out that the system is mature and efficient. What is inherently a dangerous industrial job has been made amazingly safe by attention to detail, established operational procedures, training, and personnel policies that keep experienced people in the ATON system. If there is a fundamental change in the operation, requirements, or hardware of the Aids to Navigation system, there would be a major effect upon future fleet requirements. Examples of these types of changes are; increased contracting of ATON service work, multiple crewing

FIGURE 1. OFFSHORE BUOY TENDER: USCGC BLACKHAW 180′ WLB (390)

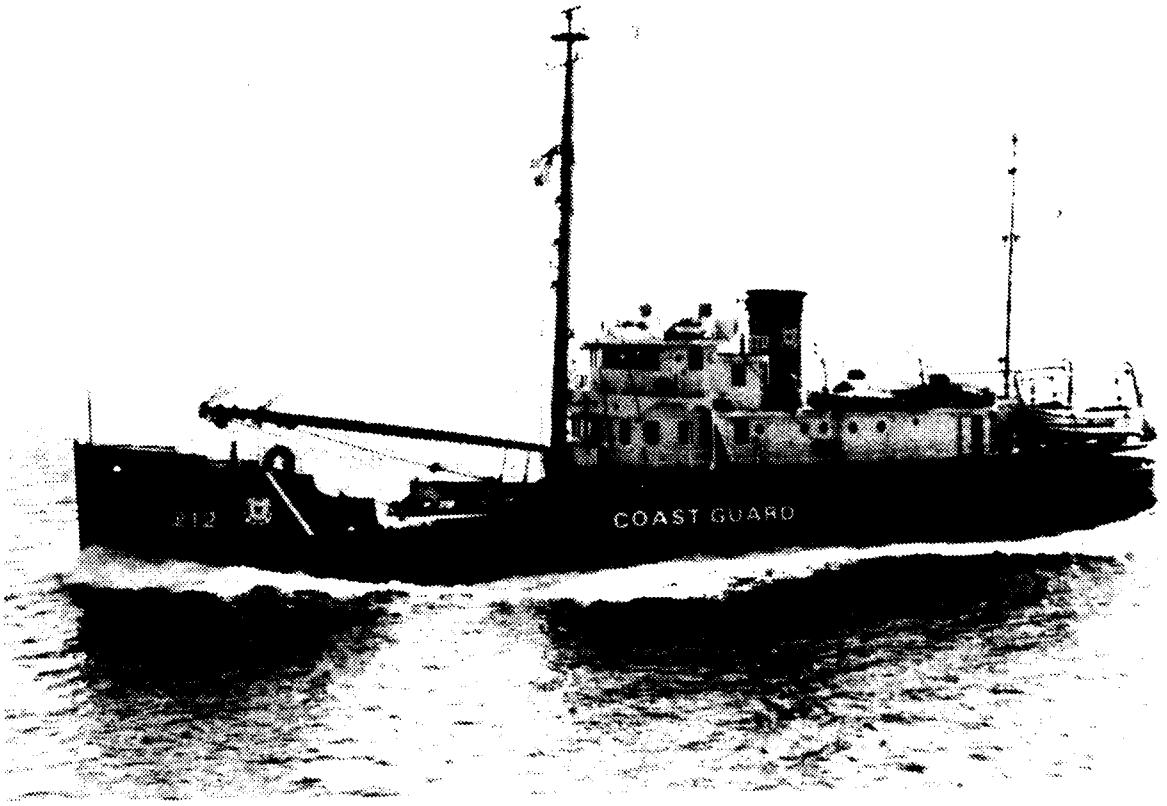


FIGURE 2. COASTAL BUOY TENDER: USCGC FIR 175' WLM (212)

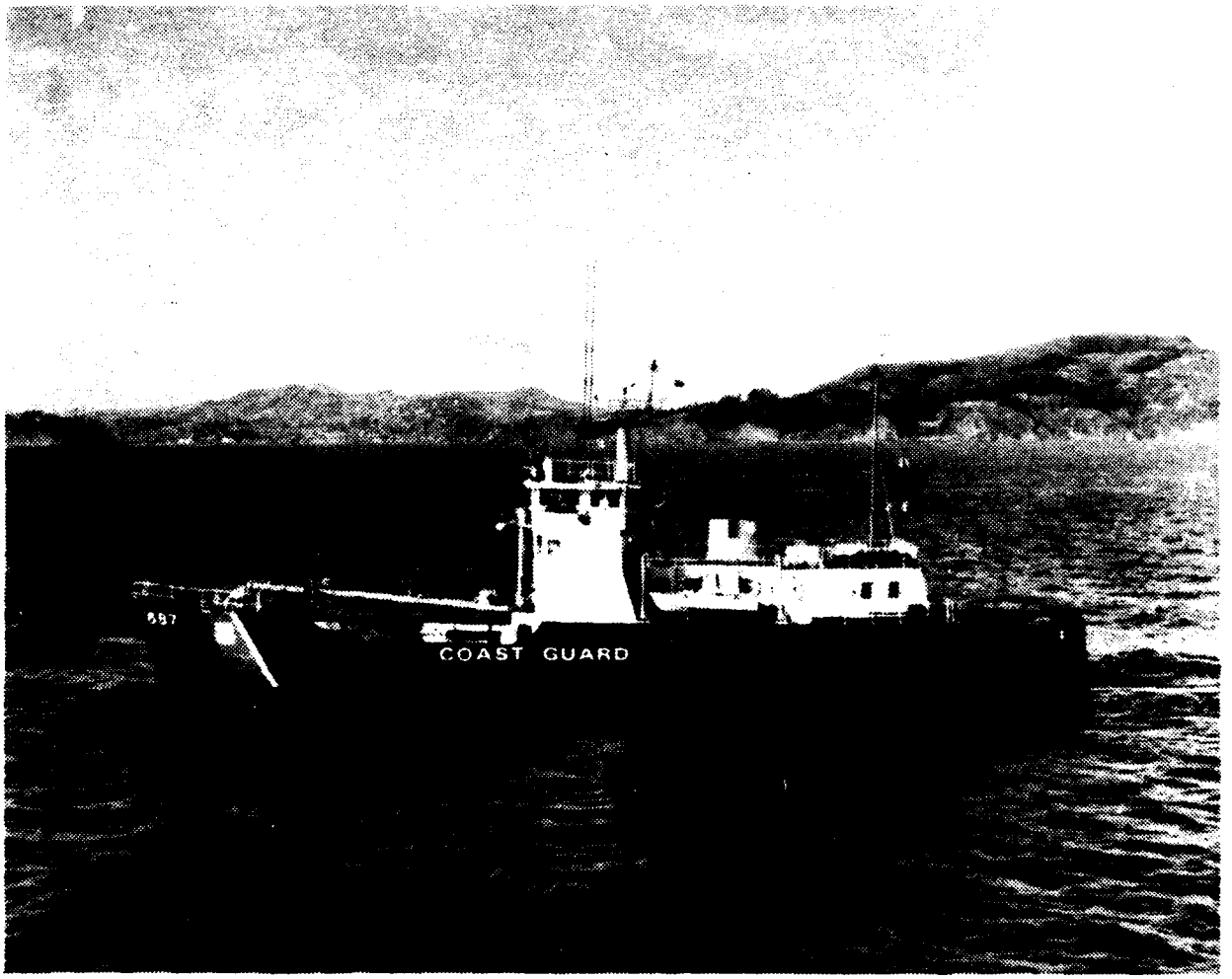


FIGURE 3. COASTAL BUOY TENDER: USCGC RED BIRCH 157' WLM (687)

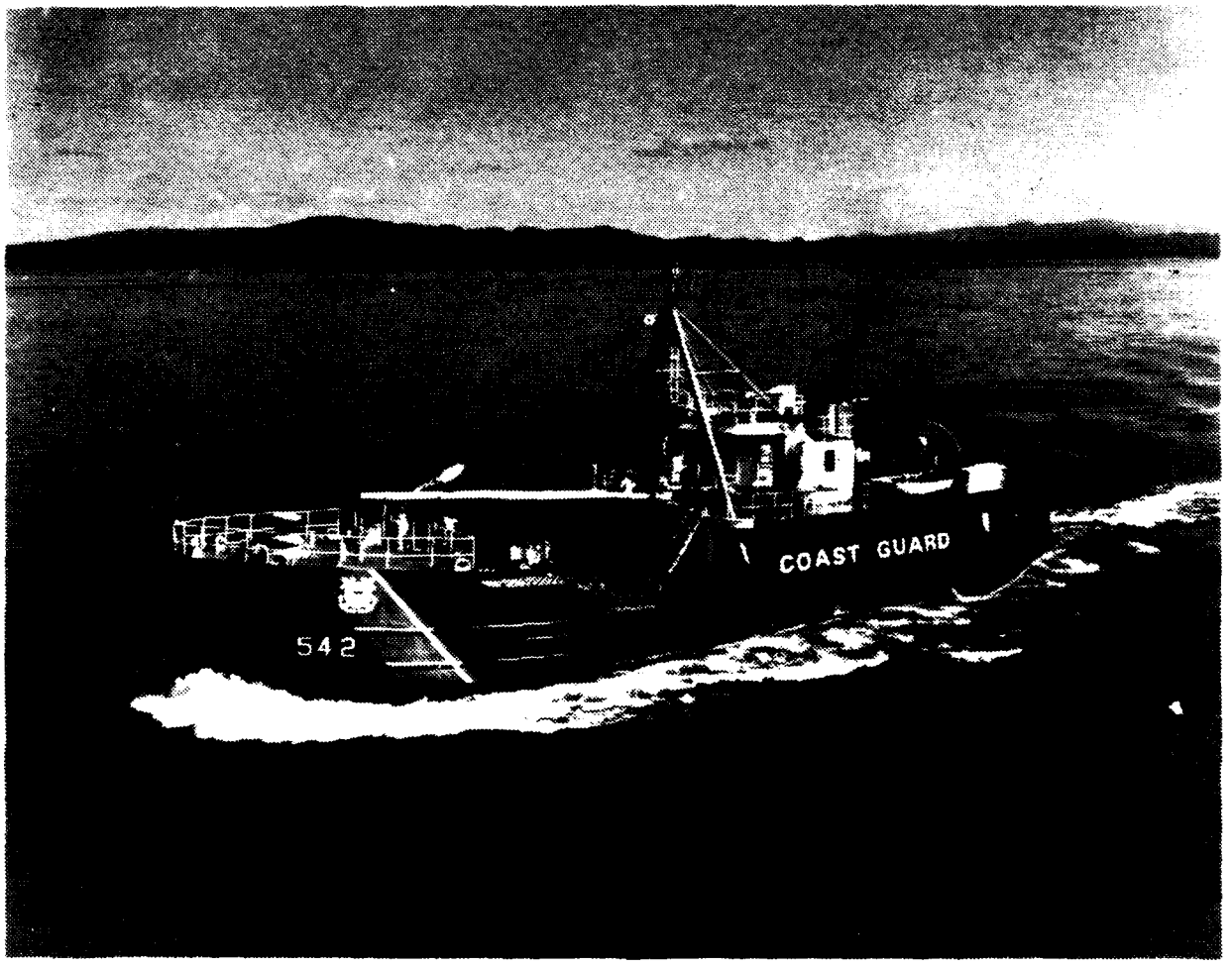


FIGURE 4. COASTAL BUOY TENDER: USCGC WHITE BUSH 133' WLM (542)
(Decommissioned)

of buoy tenders, and a significant shift to lightweight ATON systems such as foam buoys. While these are all possibilities, they are not considered likely to happen in the near-term planning horizon of 5-10 years, according to the majority of people in the District offices.

The Abstracts of Operations are summaries of operational statistics that keep track of how Coast Guard resources (cutters, aircraft, etc.) are being used. These Abstracts were the primary source of data used to generate the historical profiles of buoy tender employment. Information on the present usage came from the FY86 Abstract and interviews with District Operations Offices and buoy tender Commanding Officers and Executive Officers. Projections about the future usage of WLBs and WLMs came from the Operational Program Plans (Coast Guard projections of future resource employment), historical data trends, and interviews with District and Headquarters personnel. In addition, the Coast Guard's Office of Defense Operations, Area Maritime Defense Zone (MDZ) planners and Department of Defense agencies provided input relating to potential future requirements for Defense Operations with buoy tenders.

3.0 HISTORICAL USAGE

The data from the Abstracts of Operations were for the years 1982 to 1986. The information for 1986 was only available for the first three quarters of the fiscal year. This was scaled linearly (i.e., multiplied by the ratio of total hours per year to the total number of hours reported for the first three quarters) to obtain an estimate of the yearly usage. In 1985, the Abstract changed to a new format that provides a more accurate description of vessel operations. The information from the Abstracts with the old format was mapped over to the new format by the method shown in Appendix B. Despite the standardization of the data format by this mapping operation,

certain changes in the apparent employment of buoy tenders may be attributed to the change in reporting procedure, rather than real changes in usage. Changes in the contiguous years 1982-1984 and 1985-1986 should be immune to this potential problem.

3.1 Data Reduction

A summary of the operational data reported by the buoy tender fleet for the period is shown in Table 1. This data is extracted from Appendix E. Note that 1 "ship year" is defined as 8760 hours (8784 hours in a leap year) reportable under the Abstract of Operations' guidelines. All time is reportable for a commissioned vessel.

The overall decrease in ship years reported is due to the decommissioning of three buoy tenders (two 175' WLMs and one 133' WLM). The small variations in the total ship years are a result of partial years of service before and after major renovation periods such a SLEP.

The mapping operation described in Appendix B made the data format consistent and prepared it for reduction and analysis. The first phase of data reduction produced a profile of operations for five years for each individual buoy tender. These Unit Profiles are presented in Appendix C. The principal mission categories drawn from the Abstract format are:

Search and Rescue (SAR)
Domestic Icebreaking (DomIce)
Enforcement of Laws and Treaties (ELT)
Military Operations (MilOps)
Aids to Navigation (ATON)
Operational Training (OpTra)
Other

TABLE 1

SUMMARY OF BUOY TENDER SHIP YEARS[+] AND (TOTAL HOURS)
FROM ABSTRACTS OF OPERATIONS
1982-1986

[+] (1 Ship Year = 8760 hours except FY84 Ship Year = 8784 hours)

	WLB	WLM	TOTAL
FY82	27.9	14.3	42.2
	(244,405)	(124,800)	(369,205)
FY83	28.0	13.0	41.0
	(245,261)	(113,880)	(359,141)
FY84	28.0	13.0	41.0
	(245,952)	(114,191)	(360,144)
FY85	28.0	12.9	41.0
	(245,280)	(113,530)	(358,810)
FY86*	28	12	40
	(245,280)	(105,120)	(350,400)
Total	139.9	65.2	205.2
	(1,226,178)	(571,522)	(1,797,700)
5-Year Avg	28.0	13.0	41.0
	(245,236)	(114,304)	(359,540)

* Projected

Some of the categories are a consolidation of several related categories in the original Abstracts. The Enforcement of Laws and Treaties category includes ELT - Domestic Fisheries, ELT - Foreign Fisheries, ELT - Drugs, and ELT - Other. Military Operations is the sum of MilOps, MilPrep (Military Preparedness), and Reserve. Aids to Navigation includes ATON and RadNav (Radio Navigation). Discrepancy response data was not available from the Abstracts of Operations nor is it maintained in any consistent format in the various District offices. Therefore the time spent on this task is not discernible from normal ATON operations in the data base. The hours in the remaining categories were not very large so they were grouped together and titled Other. To produce a single number of hours for a given mission category the Resource Hours, Inport Ops Hours and High Readiness Hours were added together. This represents the total amount of time the unit was committed to that mission. The two final categories, Maintenance and Standby, were treated the same as any other mission.

3.2 Analysis

The second phase of data reduction produced the Mission Profiles which are presented in Appendix D. To obtain these, the total number of hours for each mission and each ship type were summed by year for each District.

The mission totals for all Districts for each year then give a Coast Guard-wide summary of hours for each mission. The percentage of total mission hours for each category for each year was also calculated. The five-year trends for each mission are plotted in terms of hours and percentage of total mission hours, and are presented in Appendix E along with the Mission Hours Summaries and Total Hours Summaries. Note that the term "Total hours" represents the total number of hours accounted for in the Abstracts, while the "Mission hours" is the sum of all hours reported for all missions except Standby and Maintenance. [This is one way to represent the overall trends of the Coast Guard-wide usage of the buoy tender

"ship system".] The two types of buoy tenders are tabulated separately since it is clear that they have different employment characteristics.

The following analysis of the historical usage of the buoy tender fleet is based on the processed data from the Abstracts of Operations presented in Appendices C and D and the summary data and graphs in Appendix E.

3.2.1 Aids to Navigation (ATON)

ATON service work has clearly been the largest single mission that buoy tenders perform. On the average, WLBs spent 56% of their mission hours, and WLMs spent 87% of their mission hours on this task over the last five years. The fleet average for five years shows 65% of mission hours were spent in ATON. The 5-year summary is presented in Table 2.

TABLE 2

PERCENTAGE OF MISSION HOURS SPENT ON ATON

	WLB	WLM	TOTAL
FY82	57.0	85.6	65.4
FY83	56.6	91.9	67.5
FY84	56.3	89.3	66.2
FY85	53.5	83.3	62.5
FY86	55.2	82.4	62.2
5-Year Average	55.7	86.7	64.8

While there has been a slight decrease in ATON hours for WLBs, a corresponding decrease in reported total Mission Hours offset this. The percentage of ATON work remained relatively constant over the 5-year period. WLMs reported a rise in the percentage of ATON work between FY82 and FY83, followed by a general decline through FY86. ATON mission hours were at a maximum in FY84 and at a minimum in FY86. That same year the total reported ship years for WLMs hit a low of 12. Due to this, the fleet average for ATON for the 5-year period has dropped from a maximum of nearly 68% in FY83 to about 62% in FY86. The data also show the difference in employment standards for the two classes of buoy tenders. The WLBs spend just over half their time on ATON, the remainder of the time being devoted to a variety of multi-mission tasks. The WLMs are almost exclusively employed in ATON service work, with a relatively small amount of time involved with other missions. The multi-mission tasking of WLMs is sometimes a result of necessity in accomplishing their primary mission. In some cases it is simply a matter of being the vessel of opportunity for a given job, which is a practical and efficient use of Coast Guard resources.

3.2.2 Other Mission Areas

The MARDEZ and Defense Operations requirements continue to evolve, and as such, the employment of WLBs in Military Operations has varied widely over the last five years. Beginning in FY82 the MilOps mission hours rose to a peak of 8781 hours in FY84, only to decline to a low of 1715 hours in FY86. The 5-year average of 5273 hours represents 6.3% of WLB mission hours.

Due to their size, WLMs are not generally suited for military missions. These vessels have limited seakeeping abilities and compartmentation, and the small crew size limits their ability to properly prepare for and conduct Military Operations which are labor intensive.

Search and rescue time for WLBs has shown a steady decrease from FY82 (25%) to FY86 (3%). The average for this time was 12.6%. Despite the decline in time spent by WLBs on SAR they remain an important primary SAR resource for areas like the 17th District where the seakeeping and extended deployment capability are necessary due to the nature of the operating area. WLM SAR hours have leveled off around 750 (2%) after a high in FY82 of 1747 (5%) and a low in FY83 of 434 (1%). The 5-year average of 853 hours represents 2.5% of WLM Mission Hours. It should be emphasized that these statistics are based on the SAR Mission Hours as calculated (Resource Hours plus Inport Ops Hours plus High Readiness Hours) from the Abstracts of Operations data. In fact, underway SAR time for WLBs has remained relatively constant over the reporting period (Reference 16). The reported inport SAR standby time has decreased. This is largely due to the FY85 change in the reporting procedure. Prior to FY85, general standby time was frequently attributed to SAR, however under the new reporting procedures standby status is not mission specific, but rather a separate category.

The Enforcement of Laws and Treaties Mission Hours for WLBs have shown a fairly steady increase over the reporting period, from a low of 2971 hours (3%) in FY82, to a high of 12,303 hours for FY86 (15.5%). The WLB average is 7536 hours or 9%. During this time period the reporting category for Foreign Fisheries Patrol was added to ELT, but the biggest increase came from Drug Interdiction tasks. The overall trend clearly reflects the increased emphasis on this role for the Coast Guard in recent years. Except for a low in FY83, ELT mission hours for WLMs ranged between 900 and 1000 per year. The 5-year average of 838 hours represents 2.4% of the total mission hours.

Domestic Icebreaking duties naturally follow the vagaries of the weather and therefore show wide variations in mission hours. The data indicate that FY82, FY84 and FY86 were "ice years" and the WLB mission hours averaged 559 (.7%) for these years. In the off years FY83 and FY85, WLBs averaged 23 hours of icebreaking. The

only Districts reporting significant requirements in this category are the 1st and the 9th. WLBs in the 3rd and the 5th Districts reported small amounts in one year only. WLMs are not usually employed in icebreaking; however, in FY82 and FY85 the 3rd and the 5th Districts reported a total of 359 hours for this task. Otherwise the requirements for WLMs in this mission category are virtually non-existent.

The Operational Training hours averaged about 2635 (3%) for WLBs during FY82 through FY84. In FY85 there was a 4-fold increase in training hours followed by a slight decrease in FY86. This major increase was caused by several factors. The Cutter Training Manual was revised to reflect increased training requirements. The Abstract of Operations Instructions were also revised in an effort to improve the quality of data. The Coast Guard Office of Navigation was actively educating all units how to report their activities accurately. Additionally, WLBs were brought into the UNITREP system used by DOD for readiness reporting. Unit readiness is directly related to training activities and the formal reporting requirements reflect this. The 17th District typically shows higher Operational Training Hours because they have the most WLBs of any District and because of the long transit times to Honolulu for refresher training (REFTRA). The average for WLBs is 5516 hours or 6.6% of the mission hours. WLMs showed a similar trend in Operational Training Hours with a significant increase in FY85. The 5-year average is 1058 hours or 3% of the total mission hours.

Other miscellaneous missions make up slightly less than 10% of WLB time based on the five-year average. This category shows a fairly steady increase in total hours through FY85 to 11.7%. Although there is a decrease in total hours in FY86, this still represents 12% of the reported mission hours. WLM miscellaneous mission hours show small variations around the 5-year average of 4.6%, except in FY85 when they reported a high of 2481 hours or 6.7%.

Standby is the largest single category for both types of buoy tenders. WLB Standby Hours vary about 3% around the 5-year average of 35% of the total hours reported. The low point of 79,583 in FY85 is probably a result of the new instructions for completing the Abstract of Operations and the greater emphasis on reporting all activities performed while in port. WLM Standby Hours have decreased each year since FY82. The percentage of total hours decreases through FY85 and shows a slight upswing in FY86. The yearly percentages vary $\pm$4% around the 5-year average of 44%.

Maintenance Hours represent the second largest category of total WLB hours reported. The 5-year average of 74,929 hours is over 30% of the total hours. Due to the age of these vessels and their components, the increasing trend in Maintenance Hours and percentage of total hours is not surprising. District personnel reported that their vessels require maintenance or repair time more frequently and that this was compounded by a growing problem with parts availability. Many parts require very long lead times. Others which are no longer available must be scavenged from decommissioned vessels or remanufactured. These problems force the units to exceed the scheduled maintenance standards and reduce their availability.

4.0 PROJECTED USAGE

The projections for WLB and WLM usage came from the FY89-FY93 Operational Program Plans. Extracts of these are presented in Appendix F. Additional input was obtained from the interviews with District Office of Navigation personnel and the near-term planning schedules, as well as the trends established by the historical data.

4.1 Aids to Navigation

As can be seen from the Operational Program Plan (OPP) information in Appendix F, ATON remains the biggest projected mission area. Between FY89 and FY93, the total number of required cutter days for ATON for the WLBs and WLMs is projected to decrease.

This decrease is 30 cutter days from FY89 and FY90 and 45 days per year (1%) through FY93 for WLBs. The projected reduction for WLMs is a steady 30 cutter days per year or 1.3% of the FY89 program cutter days. External pressures such as operational budget constraints, as well as internal efforts like the Waterways Analysis and Management System (WAMS) and the Buoys to Structures Project have resulted in improvements in the efficiency of maintenance visits and reductions in the number of aids requiring WLB or WLM servicing. The implementation of advanced ATON technology such as solar panels also reduces the servicing requirements. Nonetheless, the Office of Navigation reports (Reference 16) that their total buoy population continues to grow by approximately 1% per year. Consequently, they do not expect the required cutter days for ATON to decrease. A steady requirement over the next five years for approximately 56% of WLB Mission Hours and 65% of WLM Mission Hours is more in line with the historical data and the Office of Navigation's expectations.

4.2 Other Mission Areas

The present WLBs and WLMs were built as buoy tenders in WW-II with 3-inch weapons aboard. They were not built to perform today's SAR and ELT missions. Presently, in the planning process, the Office of Operations projects buoy tender usage in SAR and ELT based upon their availability. If the next generation of buoy tenders are higher speed vessels, their value as a SAR or ELT platform would very likely drive up their projected use in these programs. WLBs and WLMs are used today in both SAR and ELT. For example, in the 17th District the WLB is a welcome insurance policy. They depend upon the seakeeping and medium endurance capability of the WLB for many SAR cases in place of a patrol boat (WPB). Consequently, the buoy tenders are frequently put on B-6 or B-24 (ready status) as a primary SAR response unit. This is done at the District planning level.

The Operational Program Plans in Appendix F project the non-ATON requirements to remain constant for all mission areas for

both WLBs and WLMs through FY93. The plans show that ELT is clearly the largest projected secondary mission for WLBs and WLMs. However, the projections are for a steady requirement of 1183 cutter days per year through FY93. This is the number of cutter days that the buoy tender program projects that these vessels can contribute to ELT. Clearly, if more time were available, it would be used. The available days projected are not consistent with the need shown by the increasing trend in the historical data base, nor with the expectations of district operational people. With some of the newer roles in ELT such as using a WLB as a mother ship for WPBs and continued emphasis on drug interdiction tasks, the projected usage of WLBs should reflect continued growth in this area.

Icebreaking is a sporadic Coast Guard requirement. Due to the nature of the mission it is difficult to project future needs, so we must rely on past usage more so than for other tasks. Historically, icebreaking has been a localized requirement, primarily in the 1st and 9th Districts. However, it should be noted that in extremely severe winters, buoy tenders from less afflicted Districts (such as the 3rd, 5th or 7th) have been temporarily transferred to assist in icebreaking duties. In FY82 icebreaking accounted for 7% of the 1st District mission hours, yet in subsequent years there was no requirement at all. In the 9th District, icebreaking averaged 2.5% for FY82, FY84 and FY86, but only .16% in the off years. In any case, if new buoy tenders are to be used for icebreaking, they must have ice-strengthened hulls. It is not necessary to make all buoy tenders ice capable. The few that are would be assigned to those locations that require this capability.

The Environmental Buoy project, one of the miscellaneous missions, is the only other program with significant usage (108 cutter days per year) projected for the WLBs. The other programs, although certainly important, do not have projections in excess of 50 cutter days per year Coast Guard wide. For

instance, the International Ice Patrol will require 30 cutter days each year to support their Marine Science Support function.

Defense Operations is a growing mission area for the WLBs. The buoy tender's role in this area has great potential, but the actual requirements have yet to be precisely defined. Consequently the OPPs do not reflect the expected increase in MilOps cutter days. A discussion of this mission area and identification of possible defense-related tasks follows.

4.3 Defense Operations - Maritime Defense Zone Requirements

Background

Existing law allows for the Coast Guard to be integrated into the Navy in time of war. A Memorandum of Agreement was signed by the Secretaries of Transportation and Navy in March 1984, and updated in July 1986 that permits Coast Guard Area Commanders to conduct maritime defense planning and exercises for the Commanders in Chief, Atlantic and Pacific Fleets while the Coast Guard is operating outside the Department of the Navy in peacetime. In May 1984 a joint OPNAV/Commandant Instruction formally designated Coast Guard Area Commanders as Commanders, Maritime Defense Zones (MARDEZ), Atlantic and Pacific, who report directly to the Fleet Commander-in-Chief in this capacity. They have subordinate MARDEZ Sector Commanders reporting to them, who are existing Coast Guard District and major Naval Base Commanders. They are responsible for planning, exercising, and when authorized and directed, conducting coastal defense, harbor defense, port security, mine countermeasures/port breakout, inshore undersea warfare, search and rescue and harbor clearance operations. They also have an anti-submarine warfare (ASW) role and other duties in support of the overall mission.(1)

Mission

The general mission for the Commanders, Maritime Defense Zone and subordinate Sector Commanders is to plan, conduct, coordinate and control operations as required to ensure the integrated defense of the area. They are to protect Coastal Sea Lines of Communication (SLOCs), and to establish and maintain necessary control of the vital littoral sea areas. The areas of responsibility include ports, harbors, navigable waters, and offshore assets where they may exercise both statutory authority and naval command capability.(2)

Military and Defense Related Tasks

Military and defense operation task scenarios have been proposed by several sources. A study by Captains Fremont-Smith and Pearl in 1982 (3) outlines many defense roles for Coast Guard buoy tenders. Since that time, Commander, Mine Warfare Command performed a test using a WLB in a mine countermeasures role (4). Coast Guard Headquarters, Defense Operations (G-ODO) has compiled a report on military uses of WLBs (5) utilizing inputs from Commander, Maritime Defense Zones Atlantic (COMUSMARDEZLANT) and Pacific (COMUSMARDEZPAC) (6). The military and defense-related tasks listed in Appendix G are derived from these sources. The emphasis given to each of the various tasks is from a planning directive issued by COMUSMARDEZLANT (8).

The projected military missions are still being resolved, and various staff elements within the Coast Guard need to agree on requirements and incorporate them into the Mission Needs Statement for the WLB/WLM Acquisition. Other pressures within the Coast Guard are forcing resolution of these needs, and requirements are being developed.

Potential Defense Operations requirements and Naval Warfare Missions are discussed in Appendix G.

5.0 SUMMARY

The Coast Guard presently operates 28 offshore buoy tenders designated as WLBs and 12 coastal buoy tenders, or WLMs. These vessels are approaching the end of their projected service life, and the Coast Guard has identified the need for replacing the capability provided by the current fleet. This report identifies that capability by summarizing the employment history of these vessels over the last five years. In addition, projections for program requirements for buoy tender cutter days over the next five years are presented.

A summary of buoy tender employment for fiscal years 1982 through 1986 is presented in Table 3. The figures represent the five year average of the percentage of total mission hours reported for each mission area.

TABLE 3
1982 - 1986 BUOY TENDER EMPLOYMENT HISTORY
% TOTAL MISSION HOURS

MISSION	WLB	WLM
Aids to Navigation	55.7	86.7
Search and Rescue	12.6	2.5
Enforcement of Laws and Treaties	9.0	2.4
Operational Training	6.6	3.0
Military Operations	6.3	0.6
Domestic Icebreaking	0.4	0.2
Other (Miscellaneous Missions)	9.4	4.6

The WLMs have been employed primarily in servicing aids to navigation. The WLBs have been employed as multi-mission vessels expending slightly less than half of their mission time on missions other than aids to navigation. The percentage of total mission hours for aids to navigation work has decreased very slowly since FY83 for both types of buoy tenders. Requirements for this primary mission are expected to change little in the next five years, representing approximately 56% of the mission time for WLBs and 87% for WLMs.

The past usage of WLBs shows a definite increase in law enforcement resource hours. The majority of operational and district staff personnel consulted expect this trend to continue; however, it is not reflected in the Coast Guard's Operational Program Plans to date.

Defense Operations are a growing mission area with great potential to use Coast Guard resources, but neither the Coast Guard's Maritime Defense Zone planning efforts nor all of Department of Defense's potential uses have been made final. Consequently the program plan projections for steady requirements in this area are also subject to change, and could increase. If it is determined that the Coast Guard WLB replacement fleet will be required to perform a significant amount of the Naval warfare missions, this will have a major effect upon the vessel design. A full planning cycle based upon scenarios and response alternatives has not been completed for WLBs. Each Coast Guard District and Area has their own operational requirements. These requirements, as generated by a number of possible Naval warfare missions, must be integrated into a consistent set of operational requirements. Some of the additional capabilities required for defense operations, such as increased speed, weight handling and cargo capacities, would enhance aids to navigation operations.

The use of WLBs in search and rescue has declined steadily but is expected to level off as indicated in the program plans. Operational training requirements will most likely follow the policy decisions made with regard to Defense operations. Increased readiness will require increased training. Icebreaking duties are expected to continue as needed; however, due to the localized nature of this requirement it is not necessary to have the entire fleet ice capable. The remaining miscellaneous missions are expected to have a steady low-level requirement consistent with the historical usage.

6.0 REFERENCES

1. "Executive Summary", Maritime Defense Zone Atlantic; Rev 2/7/86.

2. "Planning Directive for Development of MARDEZLANT Subordinate Plans", Commander, U.S. Maritime Defense Zone Atlantic; 22 August 1986.

3. "Present and Proposed Military Roles for Coast Guard Buoy Tenders (WLBs)", a position paper by Captain Richard Fremont-Smith, USCG and Captain David Pearl, USCGR; December 1982.

4. "Q-Route Survey Equipment and Manpower Test Conducted Onboard USCGC PAPAW", Commander, Mine Warfare Command; 21 October 1986.

5. "Defense Operations Scenario", enclosure to letter dated 10 November 1986 G-ODO to G-APM (WLB/WLM Program Manager).

6. "Required Capabilities for New Construction WLBs", Commander, Coast Guard Pacific Area; draft letter ser: 86-309.

7. Personal communication MARDEZLANT (CDR W. Young and Captain Liebmann)/R&DC Mr. Lincoln; 20 November 1986.

8. "Planning Directive for Development of MARDEZLANT Subordinate Plans"; Commander, U.S. Maritime Defense Zone Atlantic; 22 August 1986.

9. Short Range Aids to Navigation Study, U.S. Coast Guard, June 1983.

10. SRA Service Force Mix Evaluation Methodology Report, DOT Transportation Systems Center (TSC), 1984-1985.

11. Cutter Requirements, FY87-91, USCG

12. Cutter Plan, USCG.

13. Cutter Employment Standards, (COMDTINST M5312.11) 3100.4C.

14. Memorandum of Agreement between the Department of the Navy and the Department of Transportation, July 1986.

15. Project Manager Charter: Buoy Tender Replacement Acquisition Project; 2 July 1986.

16. Commandant G-DMT-2 ltr 3900/1014S of 24 February 1987. Subj: Draft WLB/WLM Utilization Study Comments

17. G-OP Memo to G-DMT, Subject: WLM/WLB Utilization Study dated 29 Jan, 1987.

18. G-ODO Memo to G-DMT, Subject: Draft WLB/WLM Utilization Study, dated 31 March 1987.

19. Conversation with CDR M. Thomas USNR-R, Commander, Mine Division 121, 11 May 1987.

20. Mission Need Statement for WLB/WLM Capability Replacement. July 1985.

21. Draft Preliminary Sponsors Requirements Documents. U.S. Coast Guard Office of Navigation, May 1987.

APPENDIX A

APPENDIX A
LIST OF OFFSHORE (WLB) BUOY TENDERS

Tender	Number	Class	Built	Remarks	Homeport	District	(Off/ WO/ Enl) Pers
ACACIA	406	C	44	I M	Grand Haven, MI	9	3/2/40
BASSWOOD	388	C	44	L A	Guam, Marsec	14	4/2/51
BITTERSWEET	389	C	44	O M	Woods Hole, MA	1	4/2/42
BLACKHAW	390	C	44	I A	San Francisco, CA	12	4/2/42
BRAMBLE	392	C	44	I M	Port Huron, MI	9	3/2/40
BUTTONWOOD	306	B	43	L A	Galveston, TX	8	4/2/46
CONIFER	301	A	43	S	San Pedro, CA	5	4/2/42
COWSLIP	277	A	42	S	Portsmouth, VA	5	4/2/42
FIREBUSH	393	C	44	L M	Kodiak, AK	17	4/2/46
GENTIAN	290	A	42	S	Atlantic Beach, NC	5	4/2/42
HORNBEAM	394	C	44	M	Cape May, NJ	3	4/2/42
IRIS	395	C	44	A	Astoria, OR	13	4/2/42
IRONWOOD	297	B	43	O L M	Kodiak, AK	17	4/2/49
LAUREL*	291	A	42	S L A	SLEP	11	4/2/49
*MADRONA**	*302*	A	43	S A	SLEP	5	4/2/42
MALLOW	396	C	44	L A	Honolulu, HI	14	4/2/50
MARIPOSA	397	C	44	M	Detroit, MI	9	3/2/40
MESQUITE	305	B	43	M	Charlevoix, MI	9	3/2/40
PAPAW	308	B	43	A	Charleston, SC	7	4/2/42
PLANETREE	307	B	43	L A	Ketchikan, AK	17	4/2/49
SAGEBRUSH	399	C	44	A	San Juan, PR	7	4/2/49
SALVIA	400	C	44	A	Mobile, AL	8	4/2/42
SASSAFRAS	401	C	44	O M	Honolulu, HI	14	4/2/50
SEDGE	402	C	44	O I L M	Homer, AK	17	4/2/49
SORREL	296	A	43	I S	New York, NY	3	4/2/42
SPAR	403	C	44	I M	Portland, ME	1	4/2/42
SUNDEW	404	C	44	I M	Duluth, MN	9	3/2/40
SWEETBRIAR	405	C	44	O L M	Cordova, AK	17	4/2/49
SWEETGUM	309	B	43	A	Mayport, FL	7	4/2/42
WOODRUSH	407	C	44	L M	Sitka, AK	17	4/2/49

See Remarks section on next page.

Remarks

A - Austere renovation - limited habitability improvements, 100KW generators, A/C, heating, main propulsion motor and switchboard overhaul.

I - Ice-reinforced - All WLBs are ice-strengthened with plating of additional thickness from normal waterline to the 8-foot waterline. Ice-reinforced WLBs have thicker hull plating below the 8-foot waterline. Not considered a factor in less than 38" blue ice.

L - Long-range communications - only 14th and 17th Distict tenders; includes an MF transmitter, an HF transmitter, a UHF-AM transceiver, an MF-HF receiver, a teletype and off-line crypto.

M - Major renovation - Propulsion machinery modifications, bow thruster installation, habitability improvements, including A/C, hydraulic weight handling gear installation, generator and electrical distribution panel upgrade, structural renewal and hull preservation and miscellaneous modernization.

O - Ordnance vessel - Carry 2 mounted 20mm machine guns in addition to regular WLB armament. (Two 40mm and two .50 cal mg.)

S - Service Life Extension Program (SLEP) - new main engines, computerized propulsion control system, hydraulic weight handling system, rewind main motors and propulsion generators, bow thruster, habitability improvements, renew or replace auxiliary equipment, new electrical distribution system, and structural renewal.

* - Currently in shipyard for SLEP

APPENDIX A

COASTAL (WLM) BUOY TENDERS

GENERAL INFORMATION

WLM	Length	Hull Number	Homeport	District	Year Built	Personnel*
FIR	175'	212	Seattle, WA	13	39	3/2/35
RED BEECH	157'	686	New York, NY	3	64	2/2/27
RED OAK	157'	689	Gloucester City, NJ	3	71	2/2/27
REDWOOD	157'	685	New London, CT	3	64	2/2/27
RED BIRCH	157'	687	Baltimore, MD	5	65	2/2/27
RED CEDAR	157'	698	Portsmouth, VA	5	70	2/2/27
WHITE HEATH	133'	545	Boston, MA	1	42	0/1/21
WHITE LUPINE	133'	546	Rockland, ME	1	42	0/1/21
WHITE SAGE	133'	544	Woods Hole, MA	1	42	0/1/20
WHITE SUMAC	133'	540	St. Petersburg, FL	7	43	0/1/22
WHITE PINE	133'	547	Mobile, AL	8	42	0/1/21
WHITE HOLLY	133'	543	New Orleans, LA	8	44	0/1/22

*Personnel figures indicate commissioned officers/warrant officers/enlisted.

APPENDIX A

WLB GENERAL OPERATING CHARACTERISTICS

Length Overall	180'
Length Between Perpendiculars	170'
Beam	37'
Draft (maximum operational)	12.8'
Displacement (maximum operational)	1025 tons
Propulsion	Diesel Electric
Shaft Horsepower	1200 (1000 Class A)
Screws	One
Maximum Speed	13.0 KTS (12.8 Class A)
Economical Speed	7.5 KTS (7.4 Class A)
Maximum Range	13,500 (14,000 Class A), 23,500, or 31,000 NM (see text)
Range at Maximum Speed	4,500, 8,000, or 10,500 NM
Damage Stability	One compartment
Deck Space	1,430 sq. ft. (approx.)
Deck Load	50 tons
Boom Capacity	20 tons

WLM GENERAL OPERATING CHARACTERISTICS
FIR CLASS

Length Overall	175'
Length Between Perpendiculars	163'6"
Beam	34'
Draft	12'
Displacement (maximum operational)	989 tons
Propulsion	Geared Diesel
Shaft Horsepower	1350
Screws	Two
Maximum Speed	12 knots
Economical Speed	7.5 knots
Maximum Range	8,675 - 10,000 nm
Range at Maximum Speed	5,650 - 6,500 nm
Damage Stability	1 compartment
Boom Capacity	20 tons

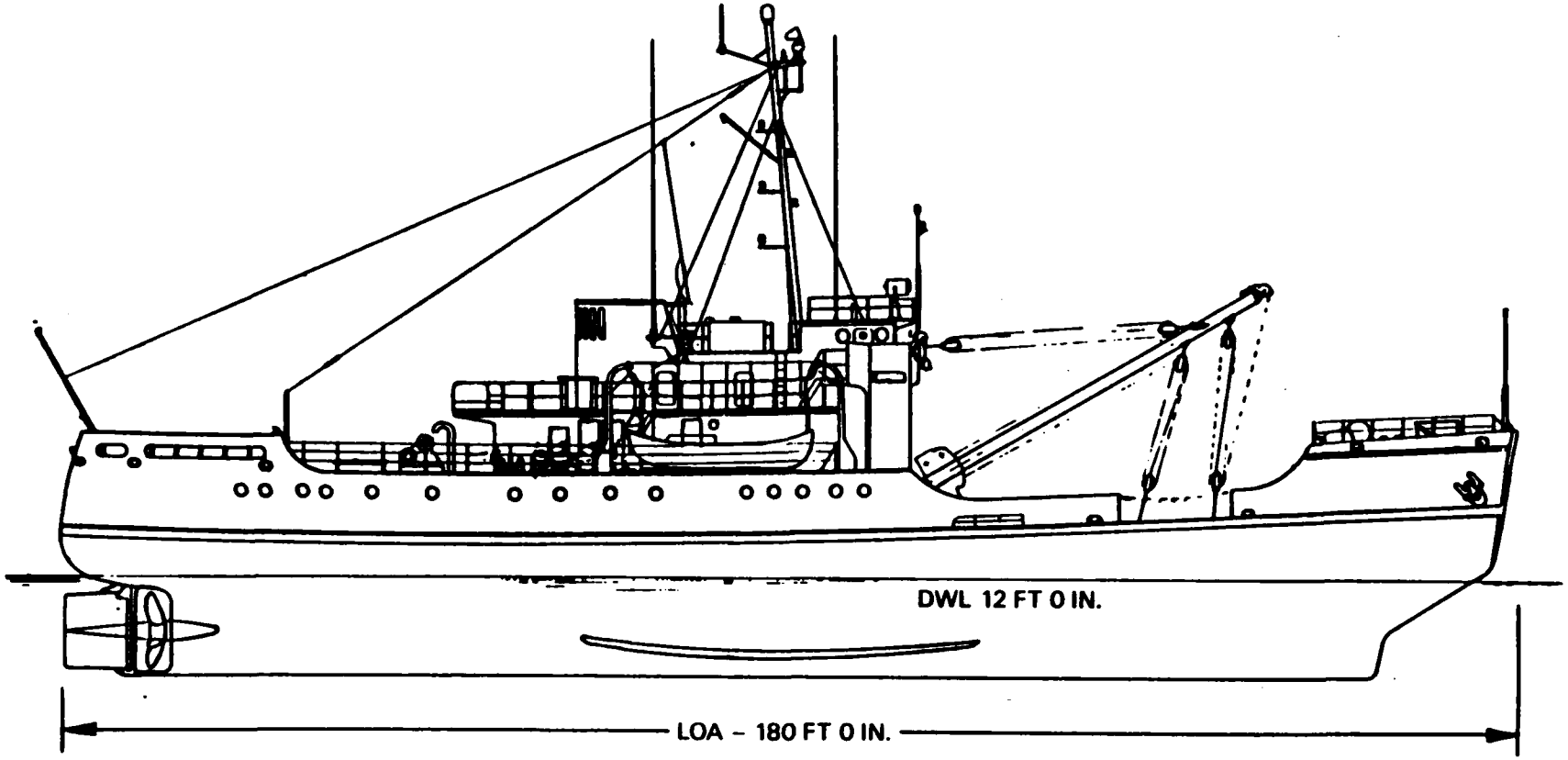
APPENDIX A

WLM GENERAL OPERATING CHARACTERISTICS
REDWOOD CLASS

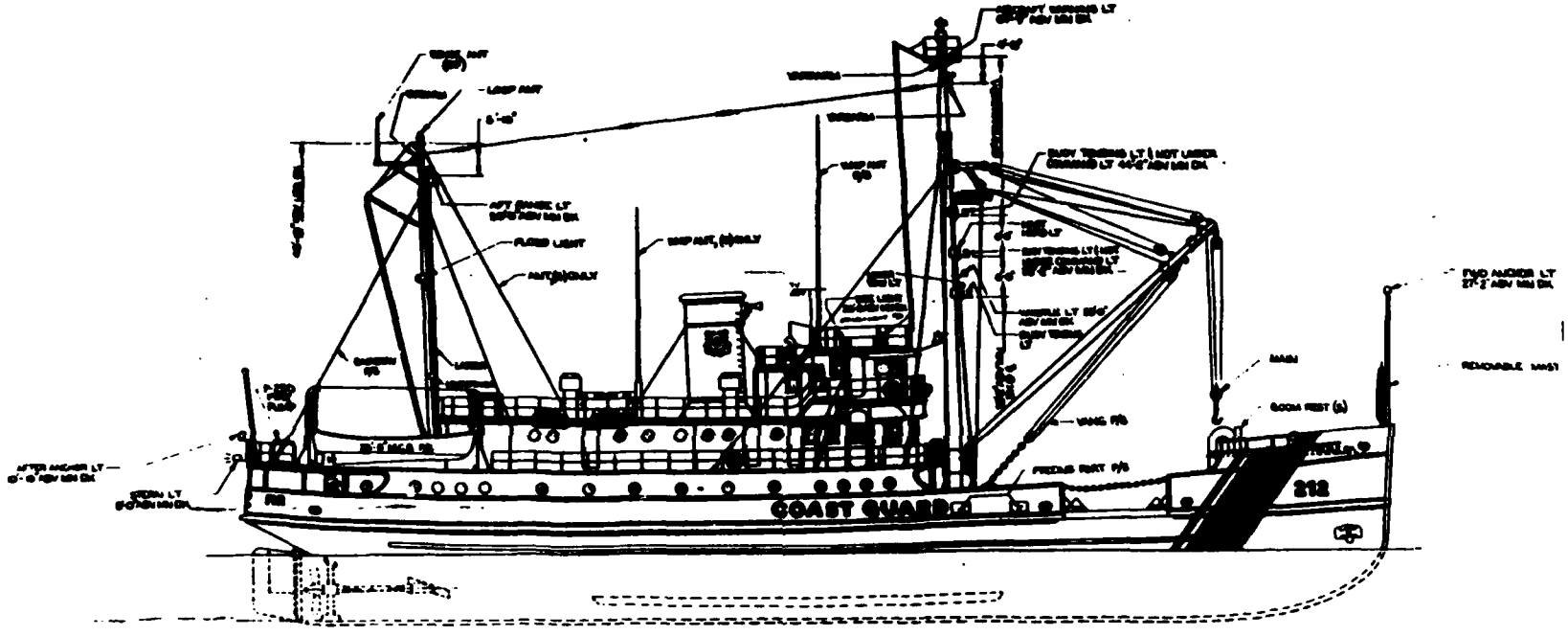
Length Overall	157'
Length Between Perpendiculars	150'
Beam	33'
Draft	6'
Displacement (maximum operational	512 tons
Propulsion	Diesel Reduction Gear
Shaft Horsepower	1800
Screws	Two (controllable pitch)
Maximum Speed	12.8 knots
Economical Speed	11.6 knots
Maximum Range	3055 nm
Range at Maximum Speed	2248 nm
Damage Stability	1 compartment
Boom Capacity	10 tons

WLM GENERAL OPERATING CHARACTERISTICS
WHITE SUMAC CLASS

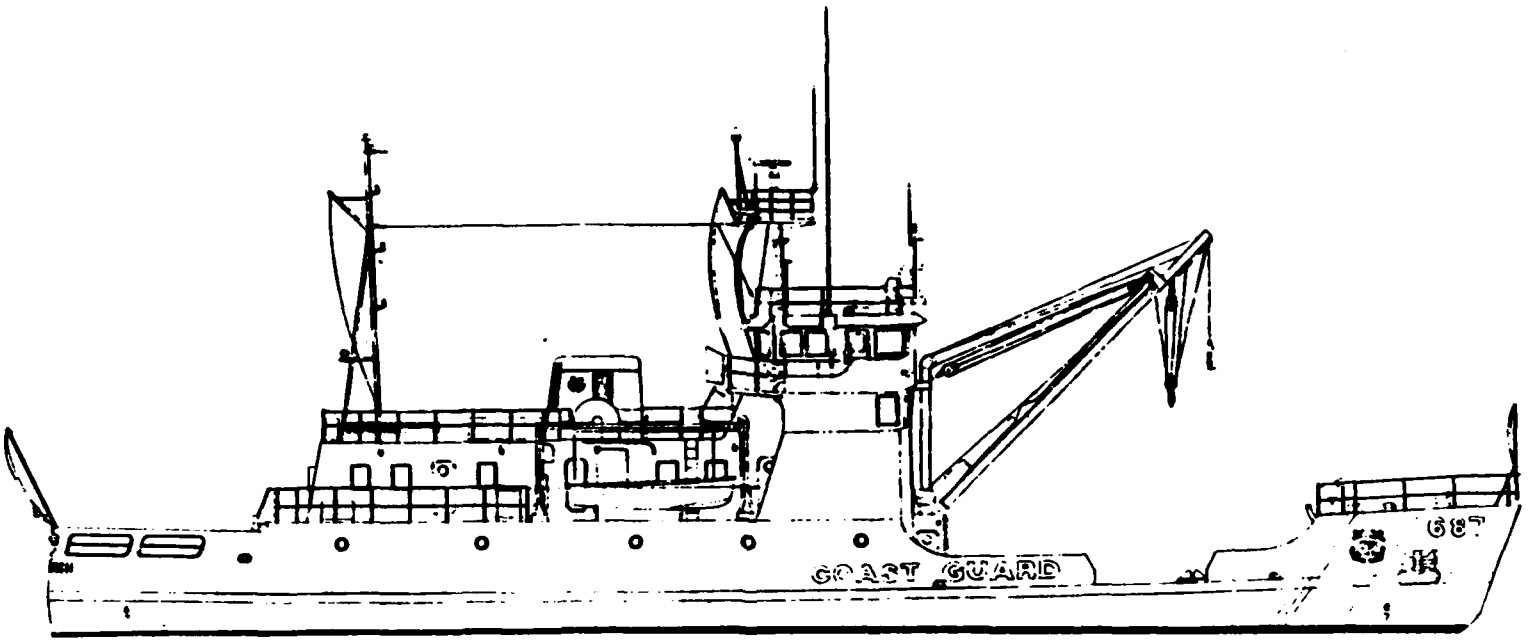
Length Overall	133'
Length Between Perpendiculars	132'
Beam	31'
Draft	9'
Displacement (maximum operational	600 tons
Propulsion	Diesel Direct (except WHITE PINE), Diesel Reduction Gear
Shaft Horsepower	600
Screws	Two
Maximum Speed	9.8 knots
Economical Speed	5.1 knots
Maximum Range	4,500 nm
Range at Maximum Speed	2,100 nm
Damage Stability	1 compartment
Boom Capacity	10 tons



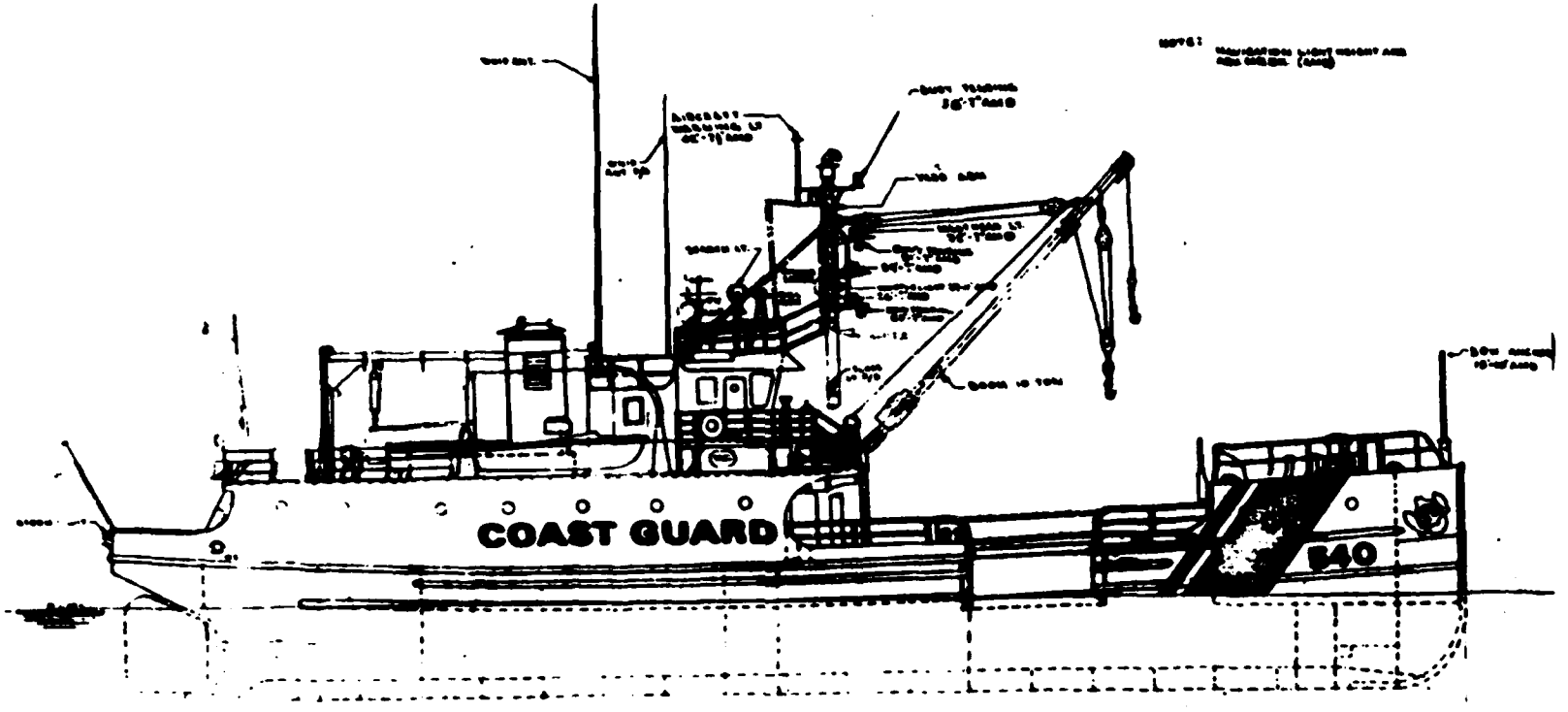
180' WLB OUTBOARD PROFILE



175' WLM OUTBOARD PROFILE



157' WLM OUTBOARD PROFILE



133' WLM OUTBOARD PROFILE

LIST OF SHORT RANGE AIDS TO NAVIGATION BY DISTRICT
(from G-NSR-1)
(CURRENT AS OF 30 SEPTEMBER 1986)

DISTRICT	1	2	3	5	7	8	9	11	12	13	14	17	TOTALS
STAFFED LTS	20	0	4	0	3	0	0	0	0	0	0	0	27
UNSTAFFED LTS	245	2236	639	1761	1930	1969	684	171	443	1054	192	621	11945
TOTAL LTS	265	2236	643	1761	1933	1969	684	171	443	1054	192	621	11972
LIGHTED BUOYS	468	28	743	579	578	398	599	117	143	272	84	187	4196
UNLTD BUOYS	2317	8497	1961	974	407	2818	1583	560	101	312	138	219	19887
TOTAL BUOYS	2785	8525	2704	1553	985	3216	2182	677	244	584	222	406	24083
LNBS	3	0	2	0	0	0	0	0	2	1	0	0	8
DAYBEACONS	216	1493	176	2065	3384	2927	128	18	126	247	151	161	11092
TOTAL AIDSTAS	3269	12254	3525	5379	6302	8112	2994	866	815	1886	565	1188	47155
FOGSIGS-STRS	93	0	54	31	1	18	84	33	38	52	0	5	409
FOGSIGS-BUOYS	396	0	212	123	125	89	79	27	73	115	0	73	1312
TOTAL FOGSIGS	489	0	266	154	126	107	163	60	111	167	0	78	1721
RACONS	5	0	8	4	3	9	15	0	2	5	0	17	68
ARTICULATED LIGHTS	0	0	6	2	2	2	2	3	0	0	3	0	20
PRIVAIDS	904	3485	4936	1464	3943	25132	2738	606	276	641	137	296	44558

NOTE: TOTAL AID STAS DOES NOT INCLUDE RACONS OR FOG SIGNALS

ARTICULATED LIGHTS INCLUDED UNDER UNSTAFFED LIGHTS

APPENDIX B
FY84-FY85 DATA TRANSFORMATION

In FY85, the format of the Abstract of Operations changed. The new format has two additional categories of employment called Standby and Inport Operations. To use information from the pre-FY85 Abstracts it is necessary to transform the information into the new format. To do so, we make the following observations and assumptions.

1. Coast Guard ATON operations did not change significantly from 1984 to 1985.
2. Resource and Maintenance hours have the same meaning in both the old and new formats.
3. Hours assigned to High Readiness and Inport Ops in the new format would have been assigned to High Readiness and Other Readiness in the old format.
4. Hours asigned to Standby in the new format would have been split in some way between High Readiness and Other Readiness in the old format.

The total hours are essentially the same in FY84 and FY85.

The total hours reported in each category for all of the WLB's for the two years 1984 and 1985 are:

1984 (old format)		1985 (new format)	
Category	Reported Hours	Category	Reported Hours
Resource	51,967	Resource	52,236
High Readiness	26,591	High Readiness	14,315
		Standby	79,583
Other Readiness	95,632	Inport	18,983
Maintenance	71,762	Maintenance	80,163
Total	245,952	Total	245,280

Since it is necessary to refer to these categories in the development that follows, we will use the following notation. Categories in the old format are identified by small letters and those in the new format are identified by capital letters.

We will now develop a linear transformation between the old and new formats. This is represented by the matrix equation below where T is the (5x4) transformation matrix.

$$\begin{bmatrix} R \\ H \\ S \\ I \\ M \end{bmatrix} = \begin{bmatrix} \quad T\ (5x4) \quad \end{bmatrix} \begin{bmatrix} r \\ h \\ o \\ m \end{bmatrix}$$

FY85 FY84

Since the hours for the resource and maintenance categories in the old format are reported the same way in the new format, the first and fifth row each have one 1 and three zeroes in the appropriate places. By assumption 3 some fraction of high readiness and other hours would be assigned to the new categories High Readiness and Inport Ops. These fractions are represented by α and β. The final new category, Standby, is made up of the remaining hours in high readiness and other readiness. This is represented by the $1-\alpha$ and $1-\beta$ terms. The transformation matrix then becomes:

$$T = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & \alpha & 0 & 0 \\ 0 & 1-\alpha & 1-\beta & 0 \\ 0 & 0 & \beta & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

Now α and β will be determined from the FY84 and FY85 data sets. At first glance it appears the $\alpha = H/h$ and $\beta = I/o$. The resource categories (r and R) are essentially the same but the maintenance categories differ by $\theta = M-m$. We now take the θ hours and assign them to the categories H and I in direct proportion to the reported hours. Then

$$\Delta H = \frac{H \cdot \theta}{H + S + I} \quad \text{and} \quad \Delta I = \frac{I \cdot \theta}{H + S + I}$$

Then

$$\alpha = \frac{H + \Delta H}{h} \quad \text{and} \quad \beta = \frac{I + \Delta I}{o}$$

This can be rewritten as

$$\alpha = \frac{H}{h}(1 + \delta) \quad \text{and} \quad \beta = \frac{I}{o}(1 + \delta)$$

where

$$\delta = \frac{\theta}{H + S + I}$$

Using the data from the FY84 and FY85 Abstracts, the transformation matrix becomes:

$$\begin{bmatrix} 1.0 & 0 & 0 & 0 \\ 0 & 0.578 & 0 & 0 \\ -0 & 0.422 & 0.787 & 0 \\ 0 & 0 & 0.213 & 0 \\ 0 & 0 & 0 & 1.0 \end{bmatrix}$$

This matrix was used to transform all of the data from the old format to the new format. Since it was developed using the information from all 28 WLB's, any individual anomalies in reporting in the two different formats are minimized by this averaging process. The same transformation matrix was also applied to FY82 through FY84 data for WLMs.

APPENDIX C
UNIT PROFILES

The data used to generate the unit profiles came from the Coast Guard Abstracts of Operations. Data is reported according to Commandant Instruction 3127.7H. To better describe Coast Guard operations, the reporting format for the Abstract of Operations was changed in FY85. This change also brought a new awareness to the people in the field of the importance of the information that they provided. The information collected from FY85 and beyond is probably better in the sense that it may have been considered more carefully before it was reported.

The data for the years FY82-FY86 is not a sample from a larger population; it is the entire population for these years. Therefore, it is not proper to write probability statements of statistical significance about the population based upon a sample, but instead to use descriptive statistics to understand the entire population. The professional judgement of experienced personnel is always important when assessing the information in the data. Inferences drawn about the population reflect changes in the reporting procedure as well as changes in operations. When the data becomes available from the Abstracts of Operations for later years, it would be prudent to add that information to the population and extend the analysis into those out years.

APPENDIX C
UNIT PROFILES

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 1
Type WLB
Ship BITTERSWEET
Number 389

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	66	201	140	137	98	128	1.46	4.16
Dom. Ice Breaking	15	0	0	0	0	3	0.03	0.10
Enforce. Laws & Tr.	0	171	196	51	543	192	2.19	6.23
Military Operations	0	197	14	381	352	189	2.15	6.12
Aids to Navigation	2771	2061	2861	1807	1107	2121	24.20	68.77
Operation. Training	10	61	42	672	401	237	2.71	7.69
Other	137	366	185	142	241	214	2.44	6.94
Standby Hours	2931	3822	3993	3609	3187	3508	40.03	_____
Maint. Hours	2830	1881	1353	1961	2832	2171	24.77	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 1
Type WLB
Ship SPAR
Number 403

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	51	66	48	51	112	66	0.75	2.29
Dom. Ice Breaking	411	0	0	0	0	82	0.94	2.87
Enforce. Laws & Tr.	0	139	279	154	5	115	1.32	4.03
Military Operations	19	422	0	320	0	152	1.74	5.31
Aids to Navigation	2610	2515	2513	1983	1451	2214	25.26	77.30
Operation. Training	0	7	46	459	132	129	1.47	4.50
Other	36	244	7	102	140	106	1.21	3.70
Standby Hours	3233	3421	3947	3521	2514	3327	37.96	_____
Maint. Hours	2400	1946	1944	2170	4405	2573	29.36	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 3
Type WLB
Ship HORNBEAM
Number 394

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	6	100	51	79	13	50	0.57	2.18
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	167	134	247	0	0	110	1.25	4.79
Military Operations	107	0	121	330	0	112	1.27	4.87
Aids to Navigation	2500	2316	1651	778	1237	1696	19.35	74.08
Operation. Training	72	17	78	138	27	66	0.76	2.90
Other	101	163	878	128	11	256	2.92	11.19
Standby Hours	4344	5066	3308	2608	2284	3522	40.18	_____
Maint. Hours	1463	964	2450	4699	5189	2953	33.69	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 3
Type WLB
Ship SORREL
Number 296

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	0	9	77	8	37	26	0.40	1.15
Dom. Ice Breaking	0	0	71	0	0	14	0.22	0.62
Enforce. Laws & Tr.	0	66	0	287	40	79	1.21	3.43
Military Operations	0	244	293	8	0	109	1.67	4.75
Aids to Navigation	0	1185	2189	2091	1923	1478	22.69	64.40
Operation. Training	0	88	0	217	110	83	1.27	3.61
Other	0	1116	235	497	681	506	7.77	22.04
Standby Hours	0	2850	3977	3232	3907	2793	42.89	____
Maint. Hours	0	696	1942	2420	2063	1424	21.87	____
Totals (Hrs/Pct)	0	6254	8784	8760	8760	6512	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com. FINISHED SLEP
FY82 Com. IN SHIPYARD FOR SLEP

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 5
Type WLB
Ship CONIFER
Number 301

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	1278	221	0	0	0	300	9.79	27.97
Dom. Ice Breaking	45	0	0	0	0	9	0.29	0.84
Enforce. Laws & Tr.	5	41	0	0	0	9	0.30	0.86
Military Operations	106	238	0	0	0	69	2.25	6.42
Aids to Navigation	1597	1533	0	0	0	626	20.44	58.40
Operation. Training	40	0	0	0	0	8	0.26	0.75
Other	138	118	0	0	0	51	1.67	4.78
Standby Hours	3400	2655	0	0	0	1211	39.54	_____
Maint. Hours	2151	1746	0	0	0	779	25.45	_____
Totals (Hrs/Pct)	8760	6552	0	0	0	3062	100.00	100.00

FY86 Com. FINISHED SLEP
FY85 Com. SLEP
FY84 Com. SLEP
FY83 Com. INTO SHIPYARD FOR SLEP
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 5
Type WLB
Ship COWSLIP
Number 277

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	7	0	55	184	533	156	2.58	7.18
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	0	0	89	0	18	0.29	0.82
Military Operations	338	0	280	451	151	244	4.04	11.24
Aids to Navigation	2193	372	61	2253	2911	1558	25.77	71.77
Operation. Training	15	0	46	111	120	58	0.97	2.69
Other	110	0	43	373	158	137	2.26	6.30
Standby Hours	3408	756	639	1856	2749	1882	31.12	_____
Maint. Hours	1814	1359	1215	3443	2138	1994	32.98	_____
Totals (Hrs/Pct)	7885	2487	2339	8760	8760	6046	100.00	100.00

FY86 Com.
FY85 Com. FINISHED SLEP
FY84 Com. OPERATING IN FIFTH DISTRICT (PERMANENT TRANSFER)
FY83 Com. OPERATING IN THIRD DISTRICT; INTO SHIPYARD FOR SLEP
FY82 Com. OPERATING IN THIRD DISTRICT

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 5
Type WLB
Ship GENTIAN
Number 290

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	0	0	406	174	289	174	3.05	10.12
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	0	269	1415	163	369	6.48	21.52
Military Operations	0	0	654	3	3	132	2.31	7.69
Aids to Navigation	0	0	1134	1101	1015	650	11.40	37.87
Operation. Training	0	159	14	236	378	157	2.76	9.17
Other	0	0	431	193	545	234	4.10	13.63
Standby Hours	0	129	3511	2588	4052	2056	36.06	
Maint. Hours	0	1920	2365	3050	2314	1930	33.84	
Totals (Hrs/Pct)	0	2208	8784	8760	8760	5702	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com. FINISHED SLEP
FY82 Com. IN SHIPYARD FOR SLEP

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 5
Type WLB
Ship MADRONA
Number 302

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	179	158	152	0	0	98	2.04	5.95
Dom. Ice Breaking	12	0	0	0	0	2	0.05	0.15
Enforce. Laws & Tr.	241	16	101	0	0	72	1.49	4.35
Military Operations	0	829	119	0	0	190	3.96	11.53
Aids to Navigation	2254	1921	1762	0	0	1187	24.77	72.21
Operation. Training	4	61	4	0	0	14	0.29	0.84
Other	231	18	160	0	0	82	1.71	4.97
Standby Hours	3411	2876	1713	0	0	1600	33.38	_____
Maint. Hours	2428	2881	2434	0	0	1549	32.31	_____
Totals (Hrs/Pct)	8760	8760	6445	0	0	4793	100.00	100.00

FY86 Com. SLEP
FY85 Com. SLEP
FY84 Com. INTO SHIPYARD FOR SLEP
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 7
Type WLB
Ship SAGEBRUSH
Number 399

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	651	708	512	6	11	378	4.31	11.53
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	1174	1250	624	1377	1515	1188	13.55	36.27
Military Operations	10	197	1480	4	285	395	4.51	12.06
Aids to Navigation	812	937	863	1020	1173	961	10.96	29.34
Operation. Training	64	36	62	721	71	191	2.18	5.82
Other	309	111	10	183	202	163	1.86	4.98
Standby Hours	2937	3608	2631	2131	2889	2839	32.39	_____
Maint. Hours	2803	1913	2602	3318	2615	2650	30.24	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 7
Type WLB
Ship SWEETGUM
Number 309

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	0	95	42	0	251	78	0.89	2.74
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	24	0	794	86	1390	459	5.24	16.18
Military Operations	0	237	196	0	4	87	1.00	3.08
Aids to Navigation	1936	2088	2159	1389	1674	1849	21.10	65.21
Operation. Training	6	38	0	68	211	65	0.74	2.28
Other	250	267	32	538	402	298	3.40	10.50
Standby Hours	3840	3927	4002	1925	2535	3246	37.03	_____
Maint. Hours	2704	2108	1559	4754	2292	2683	30.61	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 7
Type WLB
Ship PAPAW
Number 308

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	23	179	151	1770	32	431	4.92	14.25
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	0	310	4	1408	344	3.93	11.38
Military Operations	193	214	366	96	0	174	1.98	5.74
Aids to Navigation	1904	1701	1491	1339	1210	1529	17.44	50.54
Operation. Training	225	265	243	77	33	169	1.92	5.58
Other	115	100	60	440	1178	379	4.32	12.51
Standby Hours	4943	4271	3210	2103	3281	3562	40.64	____
Maint. Hours	1357	2030	2953	2931	1618	2178	24.85	____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 8
Type WLB
Ship BUTTONWOOD
Number 306

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	69	13	82	0	1	33	0.38	1.20
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	219	0	0	0	44	0.50	1.58
Military Operations	0	7	517	380	0	181	2.06	6.54
Aids to Navigation	2179	1907	1711	2449	900	1829	20.87	66.13
Operation. Training	25	3	16	347	443	167	1.90	6.03
Other	327	340	1356	456	84	513	5.85	18.53
Standby Hours	3323	2890	2427	1983	1114	2347	26.78	_____
Maint. Hours	2837	3381	2675	3145	6218	3651	41.66	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 8
Type WLB
Ship SALVIA
Number 400

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	23	37	43	128	74	61	0.69	1.73
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	3	244	301	340	321	242	2.76	6.88
Military Operations	397	583	1142	1193	0	663	7.56	18.86
Aids to Navigation	2274	1779	1546	987	2607	1839	20.98	52.31
Operation. Training	0	8	58	965	475	301	3.44	8.57
Other	344	322	485	547	350	410	4.67	11.65
Standby Hours	3318	3158	2158	1797	2813	2649	30.22	———
Maint. Hours	2401	2629	3051	2803	2120	2601	29.67	———
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 9
Type WLB
Ship ACACIA
Number 406

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	2135	1625	1430	520	0	1142	13.03	47.09
Dom. Ice Breaking	8	0	4	1	0	3	0.03	0.11
Enforce. Laws & Tr.	0	0	56	0	0	11	0.13	0.46
Military Operations	32	11	0	0	0	9	0.10	0.35
Aids to Navigation	656	1008	1416	1614	51	949	10.83	39.13
Operation. Training	113	9	63	279	87	110	1.26	4.54
Other	278	202	105	251	172	202	2.30	8.32
Standby Hours	3000	3114	3616	2084	0	2363	26.96	_____
Maint. Hours	2538	2791	2094	4011	8450	3977	45.37	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 9
Type WLB
Ship BRAMBLE
Number 392

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	2421	781	746	677	0	925	10.55	30.02
Dom. Ice Breaking	17	0	152	0	392	112	1.28	3.64
Enforce. Laws & Tr.	0	0	0	0	0	0	0.00	0.00
Military Operations	0	7	72	0	0	16	0.18	0.51
Aids to Navigation	1328	1422	1765	1622	2149	1657	18.91	53.77
Operation. Training	16	115	99	144	409	157	1.79	5.08
Other	186	226	116	230	317	215	2.45	6.98
Standby Hours	3032	3929	3343	3572	2798	3335	38.05	_____
Maint. Hours	1760	2280	2491	2515	2695	2348	26.79	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 9
Type WLB
Ship MARIPOSA
Number 397

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	959	285	106	0	55	281	3.21	7.55
Dom. Ice Breaking	0	0	231	0	82	63	0.71	1.68
Enforce. Laws & Tr.	0	0	0	0	1702	340	3.88	9.14
Military Operations	0	0	0	0	119	24	0.27	0.64
Aids to Navigation	1846	2569	3119	4671	1221	2685	30.64	72.12
Operation. Training	121	208	187	52	0	114	1.30	3.05
Other	88	190	177	432	198	217	2.48	5.83
Standby Hours	2075	3144	2876	1495	3555	2629	30.00	
Maint. Hours	3671	2364	2088	2110	1829	2412	27.52	
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 9
Type WLB
Ship MESQUITE
Number 305

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	1440	917	690	20	19	617	7.04	21.59
Dom. Ice Breaking	31	0	15	0	0	9	0.10	0.32
Enforce. Laws & Tr.	0	0	0	792	0	158	1.81	5.54
Military Operations	0	0	83	724	0	161	1.84	5.65
Aids to Navigation	1547	842	1997	916	2678	1596	18.21	55.83
Operation. Training	113	272	151	164	7	141	1.61	4.94
Other	204	233	73	355	12	175	2.00	6.14
Standby Hours	3225	3666	3312	3350	3909	3492	39.85	_____
Maint. Hours	2200	2830	2463	2439	2135	2413	27.54	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 9
Type WLB
Ship SUNDEW
Number 404

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	1722	1162	938	139	53	803	9.16	29.22
Dom. Ice Breaking	49	30	137	14	3	47	0.53	1.69
Enforce. Laws & Tr.	0	0	0	0	0	0	0.00	0.00
Military Operations	0	0	0	0	0	0	0.00	0.00
Aids to Navigation	1967	1431	1403	1060	1987	1570	17.91	57.13
Operation. Training	64	63	13	0	0	28	0.32	1.02
Other	257	205	416	179	445	300	3.43	10.94
Standby Hours	2046	3530	3167	1817	4224	2957	33.73	_____
Maint. Hours	2655	2339	2710	5551	2048	3061	34.92	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 11
Type WLB
Ship LAUREL
Number 291

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	1970	651	443	72	393	706	8.05	20.36
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	0	1491	1047	1261	760	8.67	21.92
Military Operations	433	0	293	40	20	157	1.79	4.53
Aids to Navigation	1328	1302	1409	1126	985	1230	14.03	35.48
Operation. Training	54	90	146	547	402	248	2.83	7.15
Other	310	556	506	202	255	366	4.17	10.55
Standby Hours	2769	3114	2681	2581	2015	2632	30.03	_____
Maint. Hours	1896	3047	1815	3145	3428	2666	30.42	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com. INTO SHIPYARD FOR SLEP
FY85 Com.
FY84 Com.
FY83 Com. 6552 HRS OPS IN D17; 2208 HRS OPS IN D11 (PERM TRANSFER TO D11)
FY82 Com. OPERATED IN 17TH DISTRICT

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 12
Type WLB
Ship BLACKHAW
Number 390

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	16	0	1	1	4	4	0.05	0.19
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	211	94	210	160	21	139	1.59	5.93
Military Operations	119	0	16	147	11	59	0.67	2.49
Aids to Navigation	1479	1886	2003	1757	1685	1762	20.10	75.02
Operation. Training	8	7	10	321	432	156	1.77	6.62
Other	67	231	251	338	258	229	2.61	9.75
Standby Hours	2890	3248	3175	4178	3584	3415	38.96	
Maint. Hours	3970	3294	3118	1858	2765	3001	34.24	
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 13
Type WLB
Ship IRIS
Number 395

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	2	30	8	0	3	9	0.10	0.31
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	18	34	0	55	0	21	0.24	0.79
Military Operations	13	603	2	29	0	129	1.48	4.75
Aids to Navigation	1981	2328	2255	1333	2550	2089	23.84	76.69
Operation. Training	401	81	41	253	106	176	2.01	6.47
Other	99	64	318	559	457	299	3.42	10.99
Standby Hours	3335	3387	2433	2787	2797	2948	33.63	
Maint. Hours	2911	2233	3727	3744	2848	3093	35.28	
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 14
Type WLB
Ship BASSWOOD
Number 388

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	521	451	0	151	72	239	2.73	8.44
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	392	243	280	524	361	360	4.11	12.70
Military Operations	54	88	0	56	0	40	0.45	1.40
Aids to Navigation	1176	1322	1376	2041	2757	1734	19.79	61.21
Operation. Training	3	26	54	770	345	240	2.73	8.46
Other	262	14	326	250	253	221	2.52	7.80
Standby Hours	3034	3448	2284	2456	2673	2779	31.71	_____
Maint. Hours	3318	3168	4464	2512	2300	3152	35.97	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 14
Type WLB
Ship MALLOW
Number 396

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	11	0	241	44	135	86	0.98	3.19
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	166	317	1696	743	287	642	7.32	23.74
Military Operations	210	175	265	390	512	310	3.54	11.48
Aids to Navigation	2354	1628	1040	1426	693	1428	16.29	52.81
Operation. Training	6	23	5	152	504	138	1.57	5.10
Other	35	62	43	187	170	99	1.13	3.67
Standby Hours	3833	2207	2942	4282	4075	3468	39.57	_____
Maint. Hours	2145	4348	2552	1536	2384	2593	29.59	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 14
Type WLB
Ship SASSAFRAS
Number 401

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	0	593	0	172	78	169	1.92	5.43
Dom. Ice Breaking	0	0	0	0	3	1	0.01	0.02
Enforce. Laws & Tr.	309	356	755	775	366	512	5.84	16.50
Military Operations	227	0	238	162	250	175	2.00	5.65
Aids to Navigation	1248	1752	1724	1750	2151	1725	19.68	55.56
Operation. Training	106	111	14	692	182	221	2.52	7.12
Other	402	0	217	514	378	302	3.45	9.74
Standby Hours	2914	2984	2891	2580	2227	2719	31.03	_____
Maint. Hours	3554	2964	2945	2115	3125	2941	33.55	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 17
Type WLB
Ship FIREBUSH
Number 393

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	1497	1065	960	107	39	734	8.37	23.25
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	48	228	139	380	159	1.81	5.04
Military Operations	594	29	730	295	4	330	3.77	10.47
Aids to Navigation	2044	1184	1518	1333	881	1392	15.88	44.12
Operation. Training	4	56	240	183	689	234	2.67	7.43
Other	199	375	11	565	380	306	3.49	9.70
Standby Hours	2761	3386	3207	3503	4101	3392	38.69	____
Maint. Hours	1661	2617	1890	2635	2288	2218	25.31	____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 17
Type WLB
Ship IRONWOOD
Number 297

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	930	855	621	7	9	484	5.53	16.33
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	137	461	61	105	16	156	1.78	5.26
Military Operations	0	486	0	2	0	98	1.11	3.29
Aids to Navigation	738	1153	1798	1523	1792	1401	15.98	47.21
Operation. Training	222	354	284	837	211	382	4.35	12.86
Other	91	501	448	724	469	447	5.10	15.05
Standby Hours	1313	3526	2521	3411	2471	2648	30.22	_____
Maint. Hours	5329	1424	3051	2151	3792	3149	35.93	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 17
Type WLB
Ship PLANETREE
Number 307

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	1498	494	259	69	79	480	5.47	17.09
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	312	12	65	711	220	2.51	7.84
Military Operations	16	472	0	165	5	132	1.50	4.69
Aids to Navigation	1790	1209	1159	1905	1150	1443	16.46	51.37
Operation. Training	74	32	4	301	874	257	2.93	9.16
Other	243	143	268	348	382	277	3.16	9.86
Standby Hours	2843	3437	2642	4154	2260	3067	34.99	_____
Maint. Hours	2296	2661	4440	1753	3298	2890	32.97	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 17
Type WLB
Ship SEDGE
Number 402

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	1541	849	749	105	20	653	7.45	19.71
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	124	370	179	151	856	336	3.83	10.14
Military Operations	0	440	583	0	0	205	2.33	6.18
Aids to Navigation	1988	1240	1221	1084	1054	1317	15.03	39.76
Operation. Training	714	119	365	171	1027	479	5.47	14.46
Other	292	71	66	461	725	323	3.68	9.75
Standby Hours	2120	2868	3686	3806	3833	3263	37.22	_____
Maint. Hours	1981	2803	1935	2982	1246	2189	24.98	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 17
Type WLB
Ship SWEETBRIAR
Number 405

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	2368	961	469	164	13	795	9.07	21.27
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	203	766	372	175	303	3.46	8.11
Military Operations	0	1308	0	247	0	311	3.55	8.32
Aids to Navigation	1844	1241	2168	1562	1297	1622	18.51	43.41
Operation. Training	40	69	200	1536	369	443	5.05	11.85
Other	380	96	104	84	651	263	3.00	7.04
Standby Hours	2359	3336	3177	2522	3690	3017	34.42	_____
Maint. Hours	1769	1546	1900	2273	2564	2010	22.94	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 17
Type WLB
Ship WOODRUSH
Number 407

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	572	1059	517	63	74	457	5.21	13.59
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	0	72	30	781	177	2.01	5.25
Military Operations	777	15	1317	0	0	422	4.81	12.54
Aids to Navigation	1710	892	2048	1872	1568	1618	18.46	48.12
Operation. Training	318	89	116	250	968	348	3.97	10.35
Other	327	447	164	754	15	341	3.89	10.15
Standby Hours	3979	3743	3014	3652	4232	3724	42.49	_____
Maint. Hours	1077	2515	1536	2139	1123	1678	19.14	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 1
Type WLM
Ship WHITE HEATH
Number 545

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	9	1	2	0	32	9	0.10	0.32
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	0	0	181	424	121	1.38	4.43
Military Operations	0	0	0	302	0	60	0.69	2.21
Aids to Navigation	2029	2874	2728	3051	1743	2485	28.35	90.99
Operation. Training	5	18	108	39	0	34	0.39	1.24
Other	48	7	5	18	32	22	0.25	0.81
Standby Hours	2771	3841	3461	3635	3475	3437	39.21	_____
Maint. Hours	3898	2019	2480	1534	3054	2597	29.63	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 1
Type WLM
Ship WHITE LUPINE
Number 546

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	0	2	3	0	0	1	0.01	0.03
Dom. Ice Breaking	0	0	0	0	11	2	0.02	0.07
Enforce. Laws & Tr.	0	0	0	54	225	56	0.64	1.76
Military Operations	15	4	8	0	0	5	0.06	0.17
Aids to Navigation	3298	2617	2634	2544	3622	2943	33.58	92.98
Operation. Training	12	8	0	171	123	63	0.72	1.98
Other	17	6	3	270	179	95	1.08	3.00
Standby Hours	3769	3851	4302	2858	2368	3430	39.13	_____
Maint. Hours	1649	2272	1834	2863	2233	2170	24.76	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 1
Type WLM
Ship WHITE SAGE
Number 544

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	5	0	0	0	17	4	0.05	0.23
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	0	0	0	0	0	0.00	0.00
Military Operations	0	0	0	0	0	0	0.00	0.00
Aids to Navigation	2244	1998	2242	1389	1492	1873	21.37	94.36
Operation. Training	7	20	10	25	0	12	0.14	0.62
Other	42	219	63	110	41	95	1.08	4.79
Standby Hours	4470	4414	4635	5497	4959	4795	54.71	_____
Maint. Hours	1992	2109	1834	1739	2250	1985	22.65	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 3
Type WLM
Ship RED BEECH
Number 686

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	6	6	9	34	135	38	0.43	1.55
Dom. Ice Breaking	38	0	0	39	0	15	0.18	0.63
Enforce. Laws & Tr.	146	91	21	0	0	52	0.59	2.10
Military Operations	0	0	2	48	0	10	0.11	0.41
Aids to Navigation	2263	2683	2474	1545	1459	2085	23.79	84.78
Operation. Training	161	0	136	180	87	113	1.29	4.59
Other	35	35	368	173	122	147	1.67	5.96
Standby Hours	4377	4659	4251	3899	5059	4449	50.76	_____
Maint. Hours	1734	1286	1523	2842	1899	1857	21.18	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 3
Type WLM
Ship RED OAK
Number 689

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	1	8	0	3	1	3	0.03	0.11
Dom. Ice Breaking	0	0	0	2	0	0	.00	0.02
Enforce. Laws & Tr.	0	104	0	0	0	21	0.24	0.89
Military Operations	0	26	146	0	1	35	0.40	1.48
Aids to Navigation	2409	2581	2326	1417	933	1933	22.06	82.38
Operation. Training	0	80	162	404	374	204	2.33	8.70
Other	52	66	98	282	257	151	1.72	6.43
Standby Hours	4258	4104	3408	4389	4781	4188	47.78	_____
Maint. Hours	2040	1791	2644	2263	2412	2230	25.44	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 3
Type WLM
Ship RED WOOD
Number 685

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	5	0	3	7	67	16	0.19	0.68
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	0	71	34	36	28	0.32	1.16
Military Operations	0	0	26	0	0	5	0.06	0.21
Aids to Navigation	2536	2123	2832	1341	1928	2152	24.55	88.76
Operation. Training	252	74	0	26	247	120	1.37	4.94
Other	39	32	118	274	51	103	1.17	4.24
Standby Hours	4344	4007	4486	3453	3113	3881	44.27	_____
Maint. Hours	1584	2524	1248	3625	3318	2460	28.07	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 5
Type WLM
Ship RED BIRCH
Number 687

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	12	20	19	4	0	11	0.13	0.44
Dom. Ice Breaking	175	0	0	13	1	38	0.43	1.51
Enforce. Laws & Tr.	0	0	0	0	0	0	0.00	0.00
Military Operations	0	0	0	0	104	21	0.24	0.83
Aids to Navigation	1996	2552	2969	1398	2659	2315	26.41	92.25
Operation. Training	39	211	85	53	94	96	1.10	3.84
Other	16	15	102	0	9	28	0.32	1.13
Standby Hours	3729	3681	4016	2423	4320	3634	41.46	_____
Maint. Hours	2793	2281	1593	4869	1572	2622	29.91	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 5
Type WLM
Ship RED CEDAR
Number 688

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	5	3	7	4	0	4	0.04	0.13
Dom. Ice Breaking	92	0	3	0	0	19	0.22	0.65
Enforce. Laws & Tr.	0	0	0	12	0	2	0.03	0.08
Military Operations	0	0	0	48	0	10	0.11	0.33
Aids to Navigation	2599	2880	3132	3365	1694	2734	31.19	93.88
Operation. Training	38	48	42	139	106	75	0.85	2.56
Other	93	9	64	157	21	69	0.79	2.37
Standby Hours	3703	3564	2620	2705	2179	2954	33.71	_____
Maint. Hours	2230	2256	2916	2330	4760	2898	33.07	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 7
Type WLM
Ship HOLLYHOCK
Number 220

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	3	0	0	0	0	1	0.07	0.29
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	25	0	0	0	0	5	0.57	2.43
Military Operations	0	0	0	0	0	0	0.00	0.00
Aids to Navigation	984	0	0	0	0	197	22.53	95.81
Operation. Training	8	0	0	0	0	2	0.18	0.78
Other	7	0	0	0	0	1	0.16	0.68
Standby Hours	1544	0	0	0	0	309	35.35	_____
Maint. Hours	1797	0	0	0	0	359	41.14	_____
Totals (Hrs/Pct)	4368	0	0	0	0	874	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com. DECOMMISSIONED

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 7
Type WLM
Ship WHITE SUMAC
Number 540

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	828	195	96	70	0	238	2.71	9.01
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	164	0	0	102	21	57	0.66	2.18
Military Operations	0	0	0	0	0	0	0.00	0.00
Aids to Navigation	1322	2114	2704	3086	1707	2187	24.95	82.83
Operation. Training	0	4	54	60	24	28	0.32	1.08
Other	55	100	95	380	19	130	1.48	4.91
Standby Hours	5047	4120	3289	3882	3706	4009	45.74	____
Maint. Hours	1344	2227	2546	1180	3282	2116	24.14	____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 8
Type WLM
Ship WHITE HOLLY
Number 543

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	828	195	96	70	0	238	2.71	9.01
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	164	0	0	102	21	57	0.66	2.18
Military Operations	0	0	0	0	0	0	0.00	0.00
Aids to Navigation	1322	2114	2704	3086	1707	2187	24.95	82.83
Operation. Training	0	4	54	60	24	28	0.32	1.08
Other	55	100	95	380	19	130	1.48	4.91
Standby Hours	5047	4120	3289	3882	3706	4009	45.74	_____
Maint. Hours	1344	2227	2546	1180	3282	2116	24.14	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 8
Type WLM
Ship WHITE PINE
Number 547

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	14	4	22	8	131	36	0.41	1.07
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	0	0	0	32	6	0.07	0.19
Military Operations	0	0	0	0	63	13	0.14	0.37
Aids to Navigation	2966	3284	2682	4617	2162	3142	35.85	93.46
Operation. Training	46	44	144	69	156	92	1.05	2.73
Other	0	6	34	90	235	73	0.83	2.17
Standby Hours	5146	3782	2921	1351	3510	3342	38.13	
Maint. Hours	588	1640	2981	2625	2471	2061	23.51	
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 11
Type WLM
Ship WALNUT
Number 252

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	6	0	0	0	0	1	0.09	0.28
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	0	0	0	0	0	0.00	0.00
Military Operations	76	0	0	0	0	15	1.16	3.60
Aids to Navigation	1922	0	0	0	0	384	29.33	91.09
Operation. Training	106	0	0	0	0	21	1.62	5.02
Other	0	0	0	0	0	0	0.00	0.00
Standby Hours	3544	0	0	0	0	709	54.09	
Maint. Hours	898	0	0	0	0	180	13.71	
Totals (Hrs/Pct)	6552	0	0	0	0	1310	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com.
FY82 Com. DECOMMISSIONED

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 13
Type WLM
Ship FIR
Number 212

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	23	0	211	496	352	216	2.47	7.93
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	0	0	196	379	328	181	2.06	6.62
Military Operations	35	10	35	43	114	47	0.54	1.74
Aids to Navigation	1733	2108	2306	1943	1523	1923	21.94	70.52
Operation. Training	5	34	99	177	263	116	1.32	4.24
Other	435	484	0	84	217	244	2.78	8.95
Standby Hours	3255	3667	3734	3190	3229	3415	38.96	_____
Maint. Hours	3274	2457	2203	2448	2735	2623	29.93	_____
Totals (Hrs/Pct)	8760	8760	8784	8760	8760	8765	100.00	100.00

FY86 Com.
FY85 Com.
FY84 Com.
FY83 Com. 6552 HRS OPS IN D11 (TEMP TRANSFER); 2208 HRS OPS IN D13
FY82 Com.

WLB/WLM OPERATIONAL ABSTRACT - SPECIFIC VESSEL

District 13
Type WLM
Ship WHITE BUSH
Number 542

Mission/ Category	FY82	FY83	FY84	FY85	FY86	5 Year AVG	Pct Tot Hrs	Pct Miss Hrs
Search and Rescue	2	0	122	62	0	37	0.54	1.61
Dom. Ice Breaking	0	0	0	0	0	0	0.00	0.00
Enforce. Laws & Tr.	418	0	622	215	0	251	3.62	10.84
Military Operations	0	0	13	0	0	3	0.04	0.11
Aids to Navigation	1672	2510	2008	2138	0	1666	23.99	71.94
Operation. Training	58	162	49	0	0	54	0.77	2.32
Other	546	399	317	263	0	305	4.39	13.17
Standby Hours	4246	3878	4498	3965	0	3317	47.78	____
Maint. Hours	1818	1811	1155	1767	0	1310	18.87	____
Totals (Hrs/Pct)	8760	8760	8784	8410	0	6943	100.00	100.00

FY86 Com.
FY85 Com. DECOMMISSIONED
FY84 Com.
FY83 Com.
FY82 Com.

APPENDIX D
MISSION PROFILES

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Aids To Navigation

Ship Type - WLB

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	5381	4576	5374	3790	2558	4336
3	2500	3501	3840	2869	3159	3174
5	6044	3826	2957	3354	3925	4021
7	4652	4726	4513	3748	4056	4339
8	4453	3686	3257	3436	3507	3668
9	7344	7272	9700	9883	8085	8457
11	1328	1302	1409	1126	985	1230
12	1479	1886	2003	1757	1685	1762
13	1981	2328	2255	1333	2550	2089
14	4778	4702	4140	5217	5601	4888
17	10114	6919	9912	9279	7741	8793
Totals	50054	44724	49360	45792	43852	46756
% Total Mission Hours	56.96	56.55	56.28	53.54	55.24	55.72

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Search & Rescue

Ship Type - WLB

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	117	267	188	188	210	194
3	6	109	128	87	51	76
5	1464	379	613	358	822	727
7	674	982	705	1776	294	886
8	92	50	125	128	75	94
9	8677	4770	3910	1356	127	3768
11	1970	651	443	72	393	706
12	16	0	1	1	4	4
13	2	30	8	0	3	9
14	532	1044	241	367	285	494
17	8406	5283	3575	515	234	3603
Totals	21956	13565	9937	4848	2498	10561
% Total Mission Hours	24.99	17.15	11.33	5.67	3.15	12.58

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Enforcement Of Laws & Treaties

Ship Type - WLB

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	0	310	475	205	548	308
3	167	200	247	287	40	188
5	246	57	370	1504	163	468
7	1198	1250	1728	1467	4313	1991
8	3	463	301	340	321	286
9	0	0	56	792	1702	510
11	0	0	1491	1047	1261	760
12	211	94	210	160	21	139
13	18	34	0	55	0	21
14	867	916	2731	2042	1015	1514
17	261	1394	1318	862	2919	1351
Totals	2971	4718	8927	8761	12303	7536
% Total Mission Hours	3.38	5.97	10.18	10.24	15.50	8.98

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Operational Training

Ship Type - WLB

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	10	68	88	1131	533	366
3	72	105	78	355	136	149
5	59	220	64	347	499	238
7	295	339	305	866	316	424
8	25	11	74	1312	917	468
9	427	667	513	639	503	550
11	54	90	146	547	402	248
12	8	7	10	321	432	156
13	401	81	41	253	106	176
14	115	160	73	1614	1031	599
17	1372	719	1209	3278	4138	2143
Totals	2838	2467	2601	10663	9013	5516
% Total Mission Hours	3.23	3.12	2.97	12.47	11.35	6.57

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Military Operations

Ship Type - WLB

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	19	619	14	701	352	341
3	107	244	414	338	0	221
5	444	1067	1053	454	154	634
7	203	648	2042	100	289	656
8	397	590	1659	1573	0	844
9	32	18	155	724	119	210
11	433	0	293	40	20	157
12	119	0	16	147	11	59
13	13	603	2	29	0	129
14	491	263	503	608	762	525
17	1387	2750	2630	709	9	1497
Totals	3645	6802	8781	5423	1715	5273
% Total Mission Hours	4.15	8.60	10.01	6.34	2.16	6.28

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Domestic Ice Breaking

Ship Type - WLB

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	426	0	0	0	0	85
3	0	0	71	0	0	14
5	57	0	0	0	0	11
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	105	30	539	15	476	233
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	3	1
17	0	0	0	0	0	0
Totals	588	30	610	15	479	344
% Total Mission Hours	0.67	0.04	0.70	0.02	0.60	0.41

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Other (Miscellaneous Missions)

Ship Type - WLB

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	173	610	192	244	381	320
3	101	1279	1113	625	691	762
5	479	136	634	566	703	504
7	674	478	102	1161	1782	839
8	671	662	1841	1003	435	922
9	1013	1056	887	1447	1144	1109
11	310	556	506	202	255	366
12	67	231	251	338	258	229
13	99	64	318	559	457	299
14	699	76	586	951	801	623
17	1532	1633	1061	2936	2622	1957
Totals	5818	6781	7491	10032	9530	7930
% Total Mission Hours	6.62	8.57	8.54	11.73	12.00	9.45

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Standby Hours

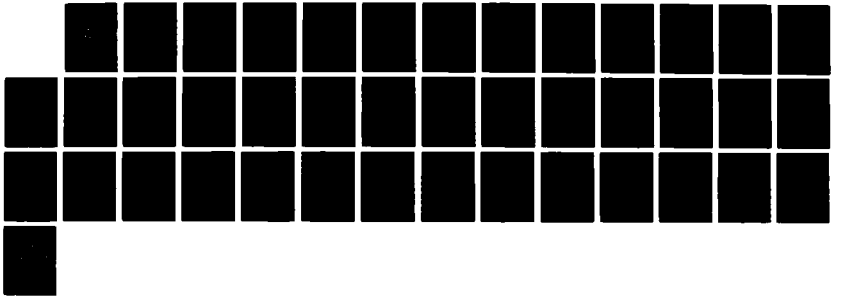
Ship Type - WLB

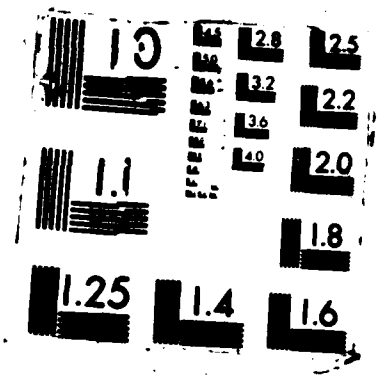
(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	6164	7243	7940	7130	5701	6836
3	4344	7916	7285	5840	6190	6315
5	10219	6416	5863	4444	6801	6749
7	11720	11806	9843	6159	8705	9647
8	6641	6048	4585	3780	3927	4996
9	13378	17383	16314	12318	14486	14776
11	2769	3114	2681	2581	2015	2632
12	2890	3248	3175	4178	3584	3415
13	3335	3387	2433	2787	2797	2948
14	9781	8639	8117	9318	8975	8966
17	15375	20296	18247	21048	20586	19110
Totals	86616	95496	86483	79583	83768	86389
% Total Hours	35.44	38.94	35.16	32.45	34.15	35.23

AD-A183 653 US COAST GUARD BUOY TENDERS: HISTORICAL AND PROJECTED USAGE(U) COAST GUARD RESEARCH AND DEVELOPMENT CENTER GROTON CT R T WALKER ET AL. JUN 87 CGR/DC-12/87 2/2

UNCLASSIFIED USCG-D-18-87 F/G 13/10 NL

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2.2
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4.0
2.0
1.8
1.25
1.4
1.6

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Maintenance Hours

Ship Type - WLB

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	5230	3827	3297	4131	7237	4744
3	1463	1660	4392	7119	7252	4377
5	6393	7906	6014	6493	4452	6252
7	6864	6051	7114	11003	6525	7511
8	5238	6010	5726	5948	8339	6252
9	12824	12604	11846	16626	17158	14212
11	1896	3047	1815	3145	3428	2666
12	3970	3294	3118	1858	2765	3001
13	2911	2233	3727	3744	2848	3093
14	9017	10480	9961	6163	7808	8686
17	14113	13566	14752	13933	14311	14135
Totals	69919	70678	71762	80163	82122	74929
% Total Hours	28.61	28.82	29.18	32.68	33.48	30.55

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Aids To Navigation

Ship Type - WLM

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	7571	7489	7604	6984	6857	7301
3	7208	7387	7632	4303	4320	6170
5	4595	5432	6101	4763	4353	5049
7	2306	2114	2704	3086	1707	2383
8	4288	5398	5386	7703	3869	5329
9						0
11	1922	0	0	0	0	384
12						0
13	3405	4618	4314	4081	1523	3588
14						0
17						0
Totals	31295	32438	33741	30920	22630	30205
% Total Mission Hours	85.58	91.91	89.31	83.26	82.45	86.69

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Search & Rescue

Ship Type - WLM

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	14	3	5	0	49	14
3	12	14	12	44	203	57
5	17	23	26	8	0	15
7	831	195	96	70	0	238
8	842	199	118	78	131	274
9						0
11	6	0	0	0	0	1
12						0
13	25	0	333	558	352	254
14						0
17						0
Totals	1747	434	590	758	735	853
% Total Mission Hours	4.78	1.23	1.56	2.04	2.68	2.45

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Enforcement Of Laws & Treaties

Ship Type - WLM

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	0	0	0	235	648	177
3	146	195	92	34	36	101
5	0	0	0	12	0	2
7	189	0	0	102	21	62
8	164	0	0	102	53	64
9						0
11	0	0	0	0	0	0
12						0
13	418	0	818	594	328	432
14						0
17						0
Totals	917	195	910	1079	1087	838
% Total Mission Hours	2.51	0.55	2.41	2.91	3.96	2.40

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Operational Training

Ship Type - WLM

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	24	46	118	235	123	109
3	413	154	298	610	709	437
5	77	259	127	192	199	171
7	8	4	54	60	24	30
8	46	48	198	129	180	120
9						0
11	106	0	0	0	0	21
12						0
13	63	196	148	177	263	169
14						0
17						0
Totals	737	707	943	1403	1499	1058
% Total Mission Hours	2.02	2.00	2.50	3.78	5.46	3.04

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Military Operations

Ship Type - WLM

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	15	4	8	302	0	66
3	0	26	174	48	1	50
5	0	0	0	48	104	30
7	0	0	0	0	0	0
8	0	0	0	0	63	13
9						0
11	76	0	0	0	0	15
12						0
13	35	10	48	43	114	50
14						0
17						0
Totals	126	40	230	441	282	224
% Total Mission Hours	0.34	0.11	0.61	1.19	1.03	0.64

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Domestic Ice Breaking

Ship Type - WLM

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	0	0	0	0	11	2
3	38	0	0	41	0	16
5	267	0	3	13	1	57
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9						0
11	0	0	0	0	0	0
12						0
13	0	0	0	0	0	0
14						0
17						0
Totals	305	0	3	54	12	75
% Total Mission Hours	0.83	0.00	0.01	0.15	0.04	0.21

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Other (Miscellaneous Missions)

Ship Type - WLM

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	107	232	71	398	253	212
3	126	133	584	729	429	400
5	109	24	166	157	31	97
7	62	100	95	380	19	131
8	55	106	129	470	254	203
9						0
11	0	0	0	0	0	0
12						0
13	981	883	317	347	217	549
14						0
17						0
Totals	1440	1478	1362	2481	1202	1593
% Total Mission Hours	3.94	4.19	3.61	6.68	4.38	4.57

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Standby Hours

Ship Type - WLM

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	11010	12106	12398	11990	10802	11661
3	12979	12770	12145	11741	12953	12518
5	7432	7245	6636	5128	6499	6588
7	6591	4120	3289	3882	3706	4318
8	10193	7902	6210	5233	7216	7351
9						0
11	3544	0	0	0	0	709
12						0
13	7501	7545	8232	7155	3229	6732
14						0
17						0
Totals	59250	51688	48910	45129	44404	49876
% Total Hours	47.48	45.39	42.83	39.75	42.24	43.63

WLB/WLM OPERATIONAL ABSTRACT - MISSION PROFILE

Maintenance Hours

Ship Type - WLM

(Units = Hours)

District	FY82	FY83	FY84	FY85	FY86	5 Year AVG
1	7539	6400	6148	6136	7537	6752
3	5358	5601	5415	8730	7629	6547
5	5023	4537	4509	7199	6332	5520
7	3141	2227	2546	1180	3282	2475
8	1932	3867	5527	3805	5753	4177
9						0
11	898	0	0	0	0	180
12						0
13	5092	4268	3358	4215	2735	3934
14						0
17						0
Totals	28983	26900	27503	31265	33268	29584
% Total Hours	23.22	23.62	24.08	27.54	31.65	25.88

APPENDIX E
SUMMARY DATA AND GRAPHS

WLB/WLM OPERATIONAL ABSTRACT - SUMMARY REPORT

Mission Hours Summary

Ship Type - WLB

(Units = Hours)

Dist	FY82	FY83	FY84	FY85	FY86	5 Year TOT	5 Year AVG
1	6126	6450	6331	6259	4582	29748	5950
3	2953	5438	5891	4561	4078	22921	4584
5	8793	5685	5691	6583	6267	33019	6604
7	7696	8423	9395	9118	11050	45682	9136
8	5641	5462	7257	7792	5254	31406	6281
9	17598	13813	15760	14856	12156	74183	14837
11	4095	2599	4288	3034	3317	17333	3467
12	1900	2218	2491	2724	2411	11744	2349
13	2514	3140	2624	2229	3115	13622	2724
14	7482	7161	8274	10799	9497	43213	9643
17	23072	18698	19705	17579	17663	96717	19343
Total	87870	79087	87707	85534	79390	419588	83918

WLB/WLM OPERATIONAL ABSTRACT - SUMMARY REPORT

Total Hours Summary

Ship Type - WLB

(Units = Hours)

Dist	FY82	FY83	FY84	FY85	FY86	5 Year TOT	5 Year AVG
1	17520	17520	17568	17520	17520	87648	17530
3	8760	15014	17568	17520	17520	76382	15276
5	25405	20007	17568	17520	17520	98020	19604
7	26280	26280	26352	26280	26280	131472	26294
8	17520	17520	17568	17520	17520	87648	17530
9	43800	43800	43920	43800	43800	219120	43824
11	8760	8760	8784	8760	8760	43824	8765
12	8760	8760	8784	8760	8760	43824	8765
13	8760	8760	8784	8760	8760	43824	8765
14	26280	26280	26352	26280	26280	131472	26294
17	52560	52560	52704	52560	52560	262944	52589
Total	244405	245261	245952	245280	245280	1226178	245236

WLB/WLM OPERATIONAL ABSTRACT - SUMMARY REPORT

Mission Hours Summary

Ship Type - WLM

(Units = Hours)

Dist	FY82	FY83	FY84	FY85	FY86	5 Year TOT	5 Year AVG
1	7731	7774	7806	8154	7942	39407	7881
3	7943	7909	8792	5809	5698	36151	7230
5	5065	5738	6423	5193	4689	27108	5422
7	3396	2413	2949	3698	1772	14228	2846
8	5395	5751	5831	8482	4551	30010	6002
9	0	0	0	0	0	0	0
11	2110	0	0	0	0	2110	422
12	0	0	0	0	0	0	0
13	4927	5707	5978	5800	2796	25208	5042
14	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0
Total	36567	35292	37779	37136	27447	174221	34844

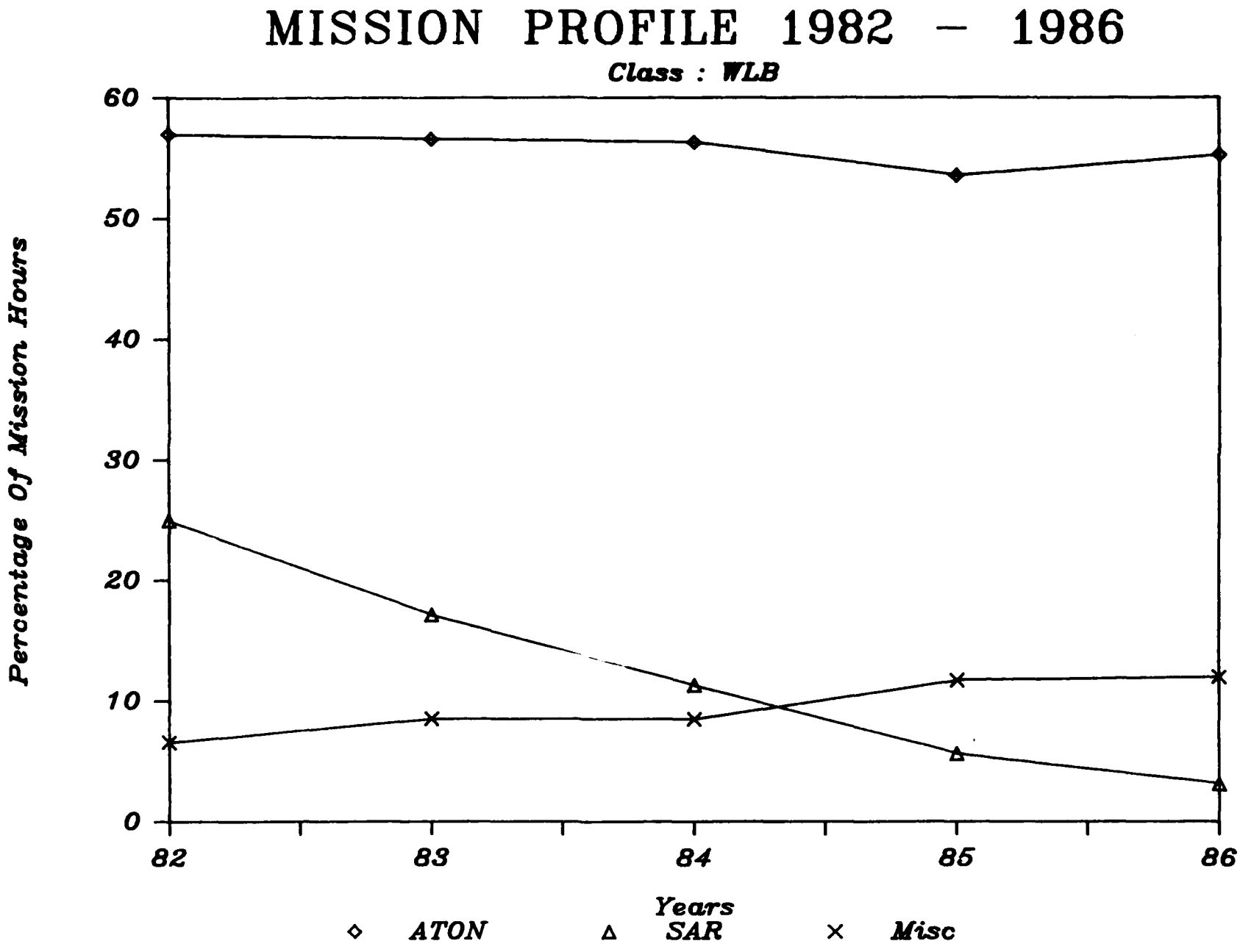
WLB/WLM OPERATIONAL ABSTRACT - SUMMARY REPORT

Total Hours Summary

Ship Type - WLM

(Units = Hours)

Dist	FY82	FY83	FY84	FY85	FY86	5 Year TOT	5 Year AVG
1	26280	26280	26352	26280	26280	131472	26294
3	26280	26280	26352	26280	26280	131472	26294
5	17520	17520	17568	17520	17520	87648	17530
7	13128	8760	8784	8760	8760	48192	9638
8	17520	17520	17568	17520	17520	87648	17530
9	0	0	0	0	0	0	0
11	6552	0	0	0	0	6552	1310
12	0	0	0	0	0	0	0
13	17520	17520	17568	17170	8760	78538	15708
14	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0
Total	124800	113880	114192	113530	105120	571522	114304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Class : WLB
Percentage Of Mission Hours
60
50
40
30
20
10
0
82
83
84
85
86
Years
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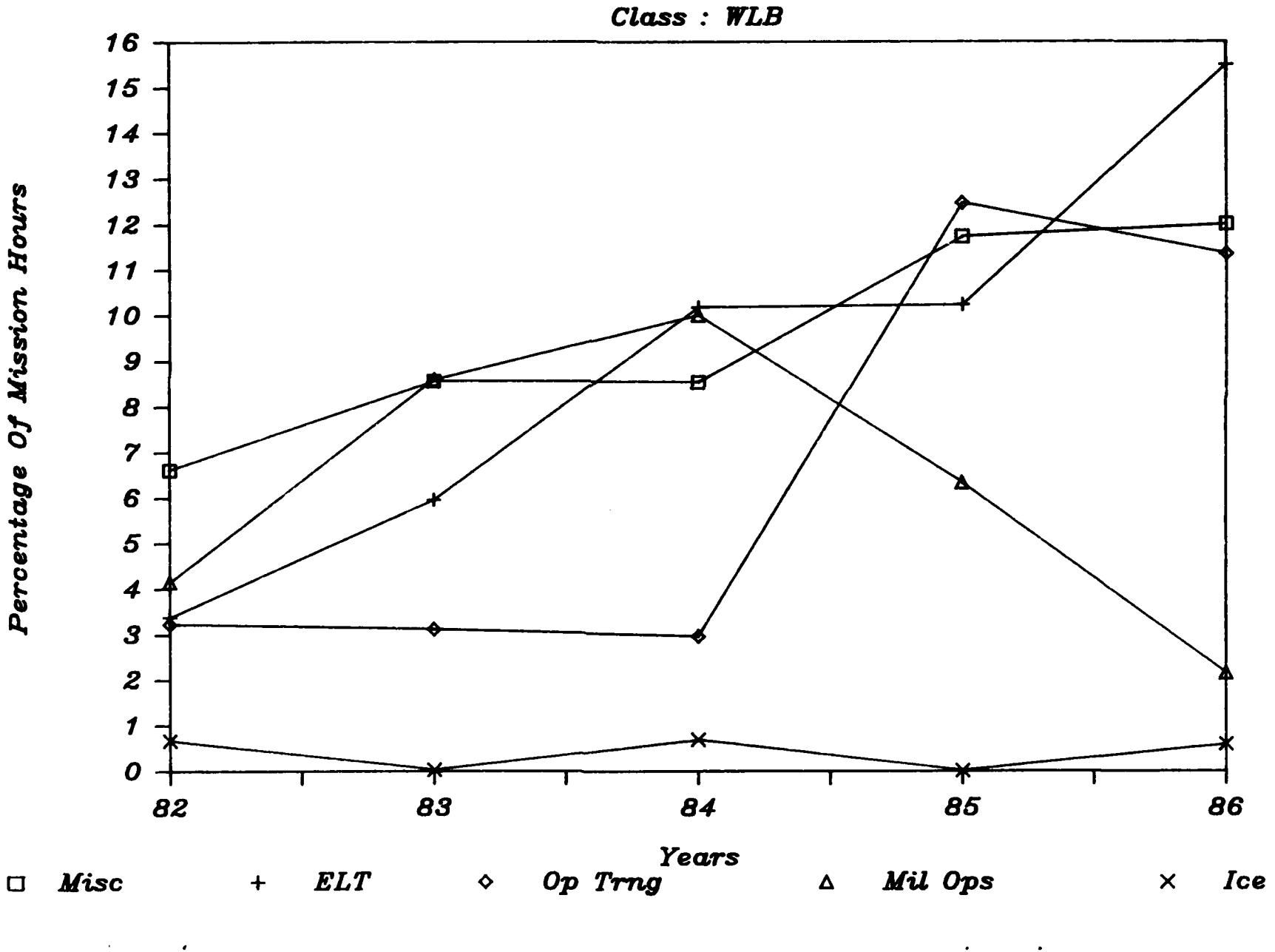
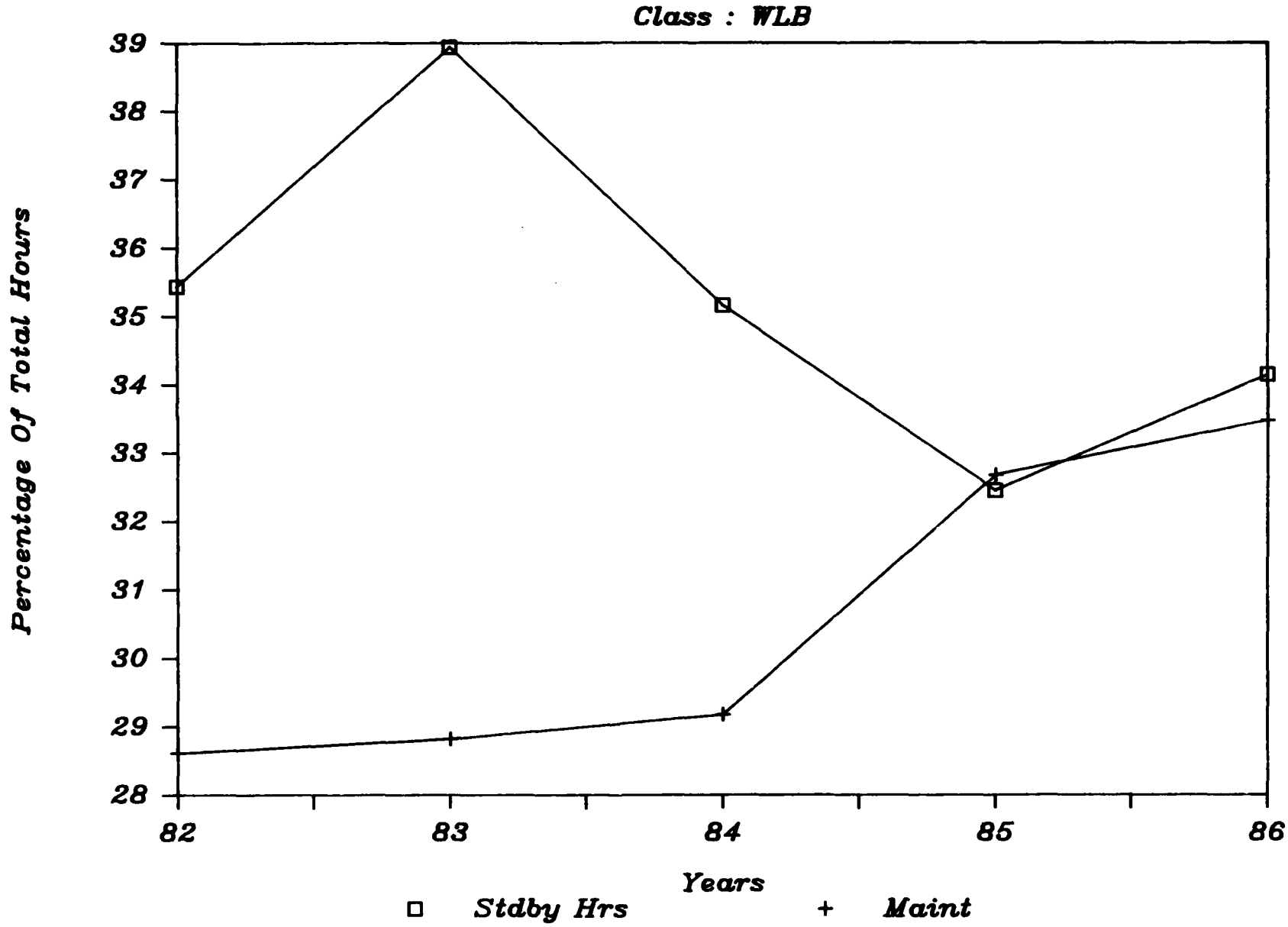
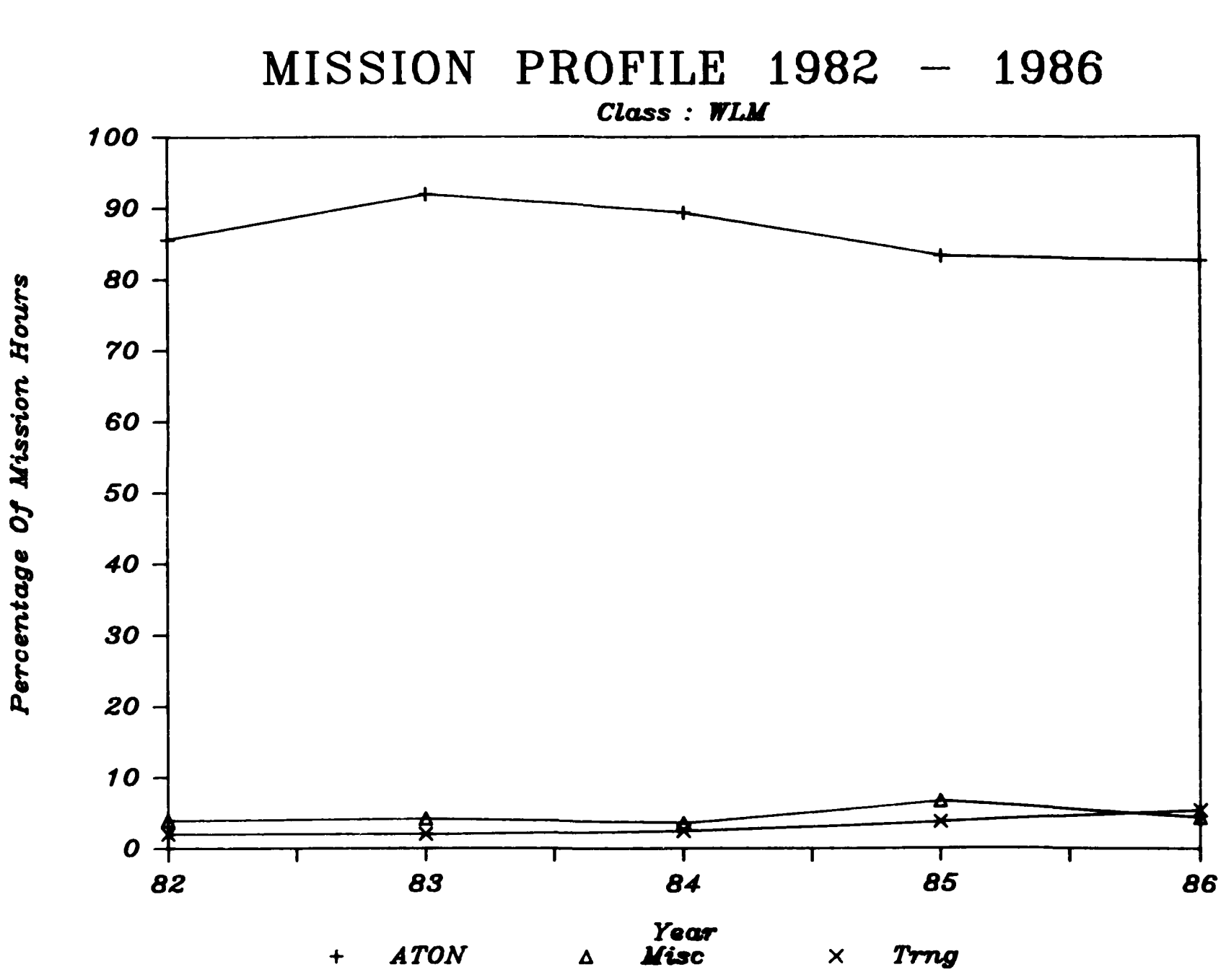
SAR
Misc

MISSION PROFILE 1982 - 1986



MISSION PROFILE 1982 - 1986

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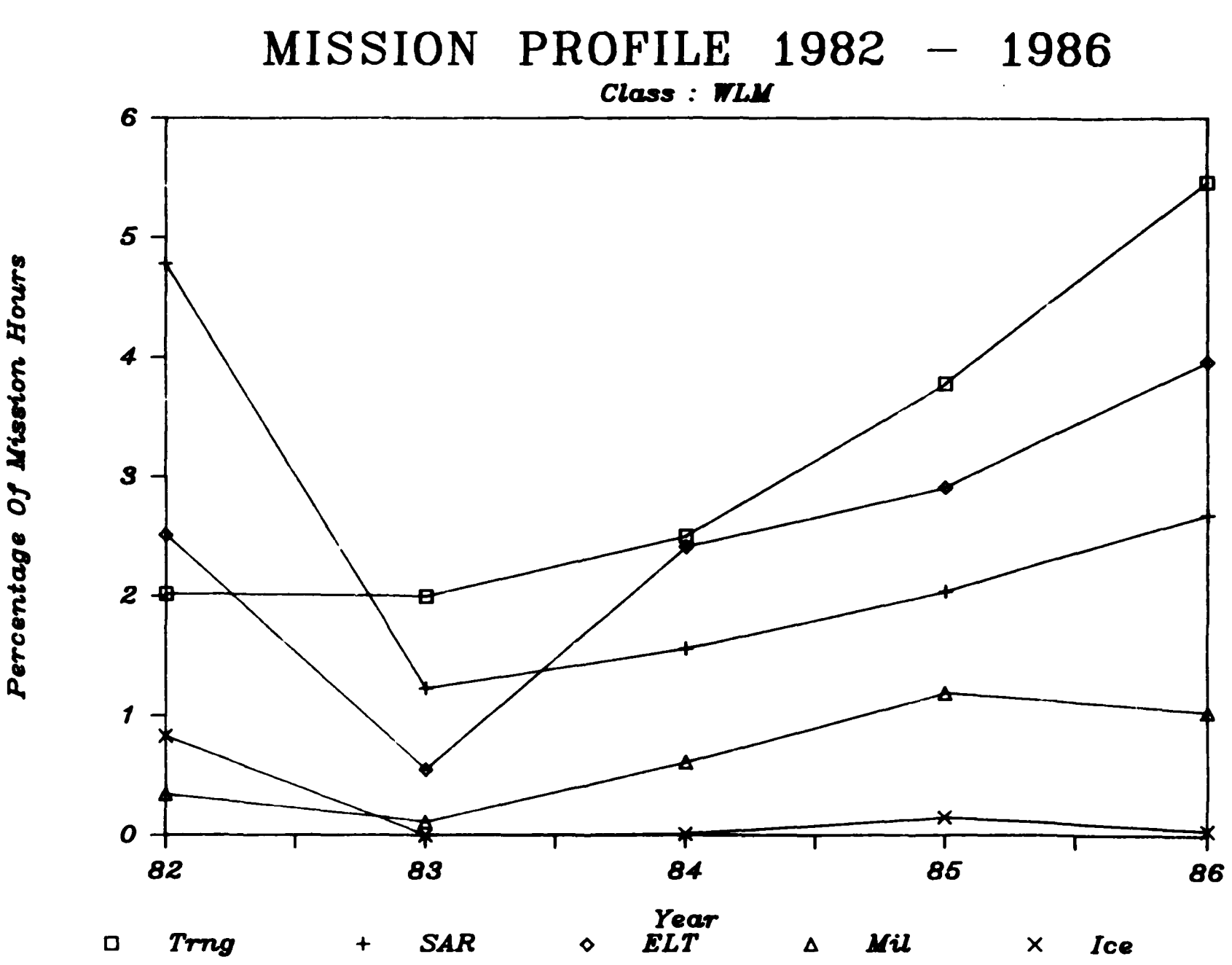
Class : WLM
Percentage Of Mission Hours
100
90
80
70
60
50
40
30
20
10
0
82
83
84
85
86
Year
+ ATON
Δ Misc
× Trng


MISSION PROFILE 1982 – 1986
Class : WLM
Percentage Of Mission Hours
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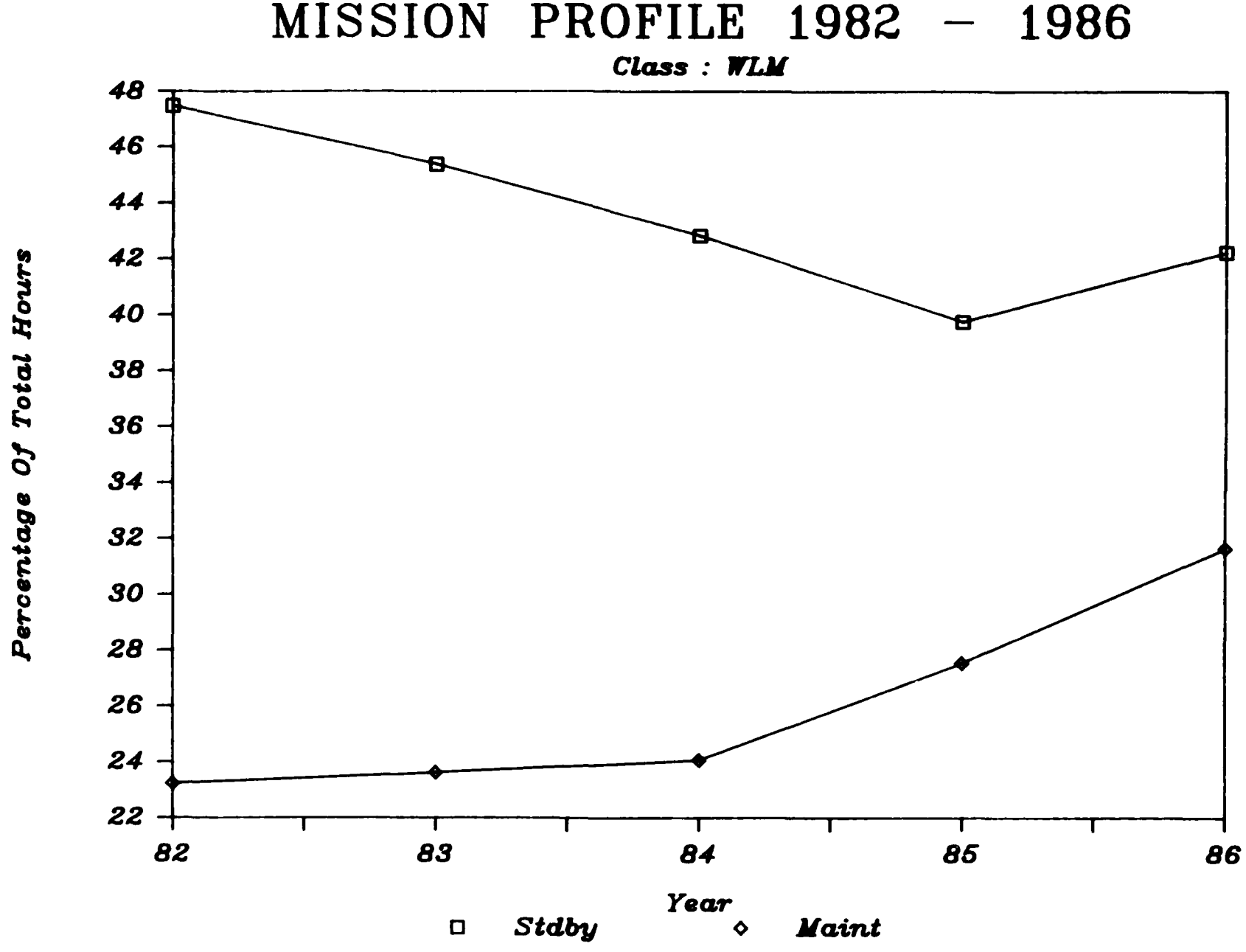
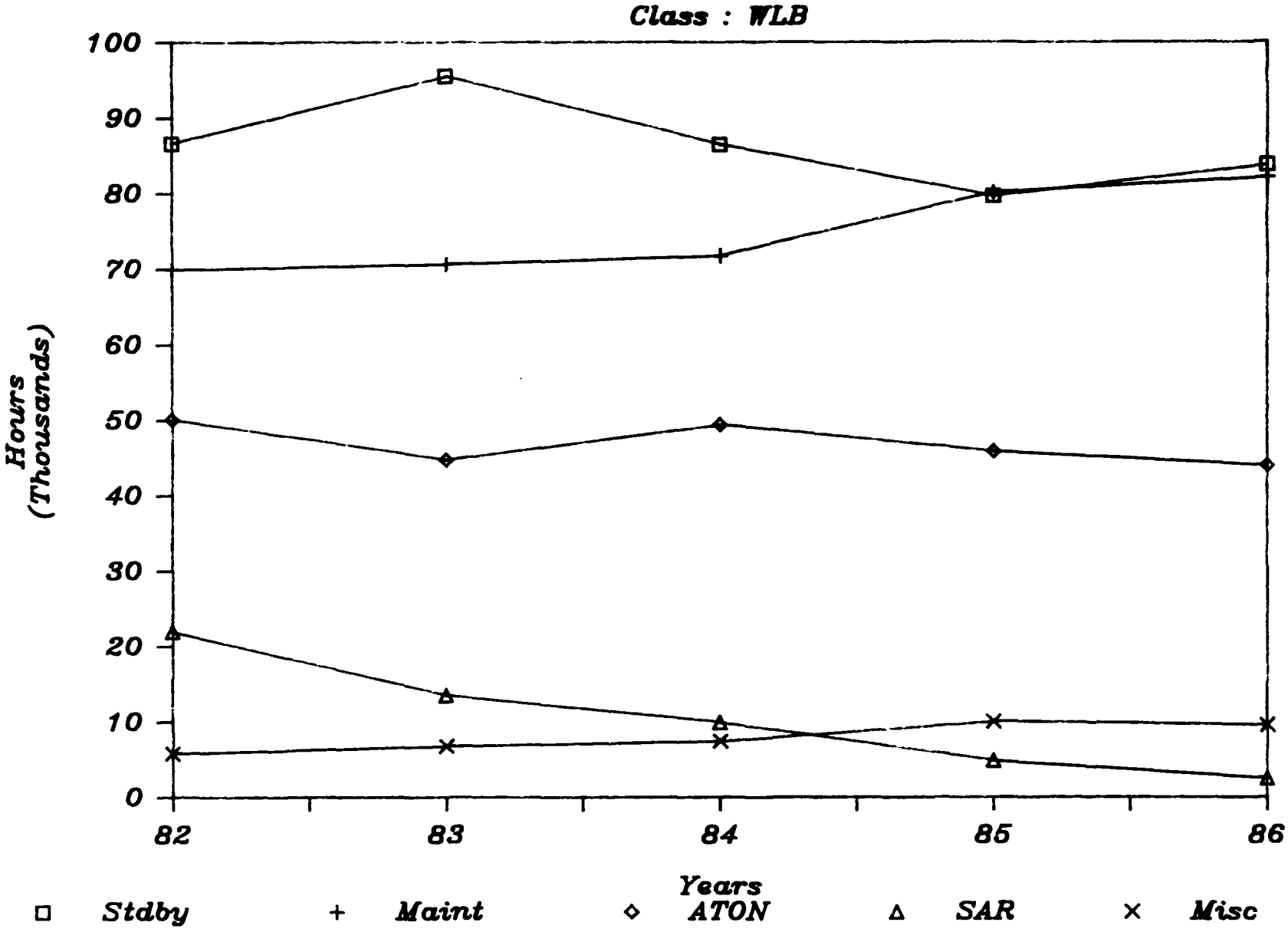
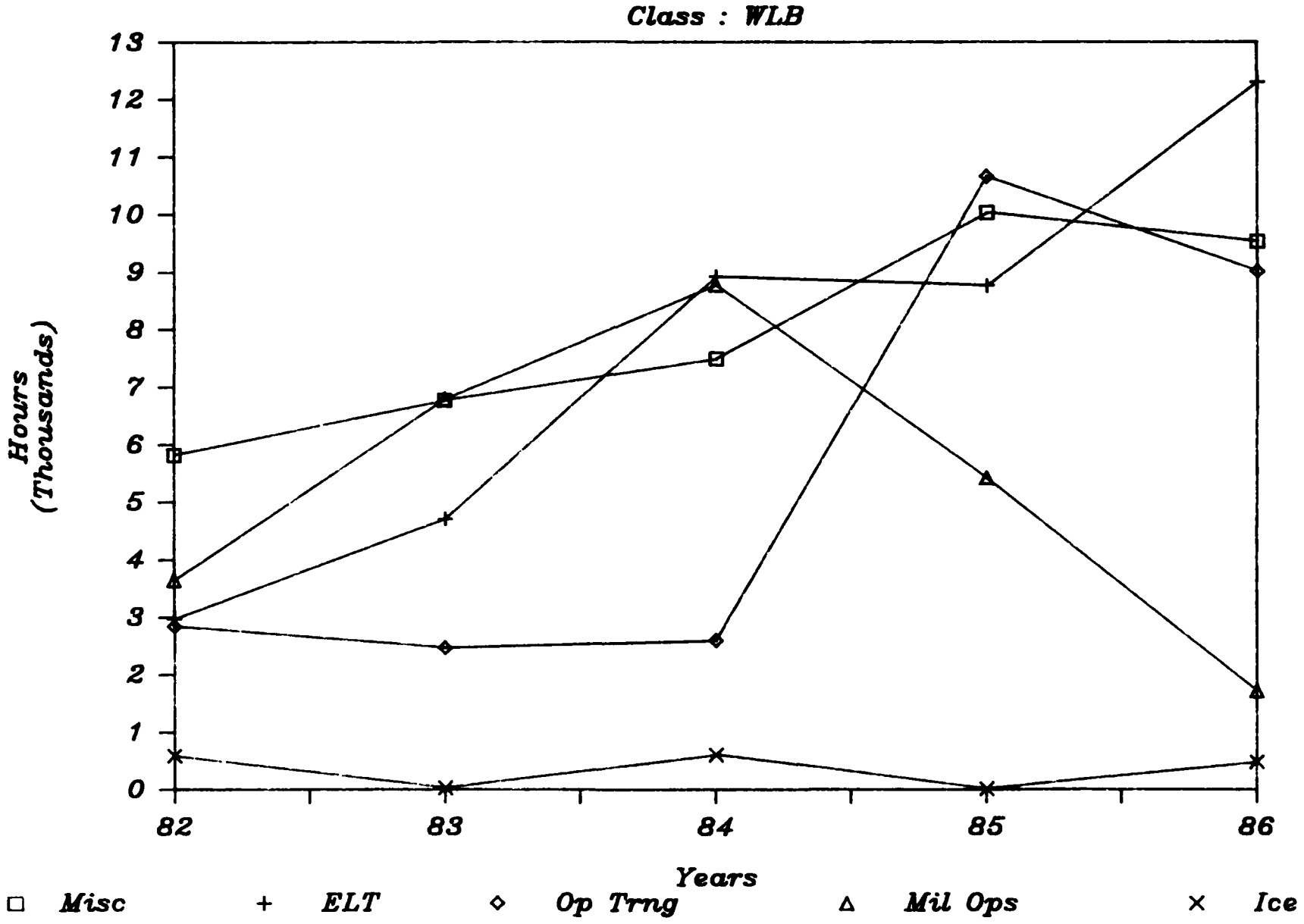
5
4
3
2
1
0
82
83
84
85
86
Year
Trng
SAR
ELT
Mil
Ice


MISSION PROFILE 1982 - 1986
Class : WLM
Percentage Of Total Hours
48
46
44
42
40
38
36
34
32
30
28
26
24
22
82
83
84
85
86
Year
Stdby
Maint

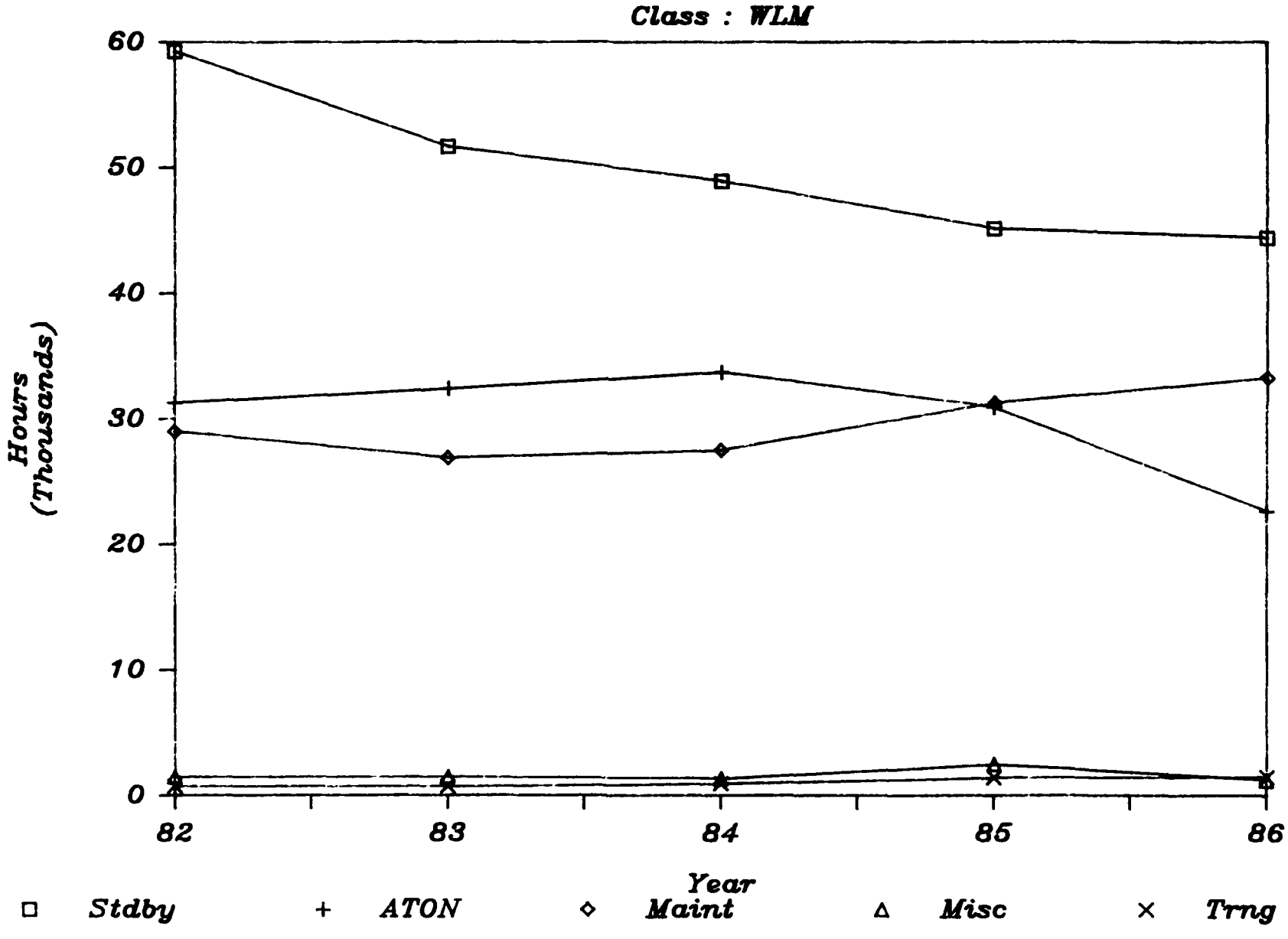
MISSION PROFILE 1982 - 1986



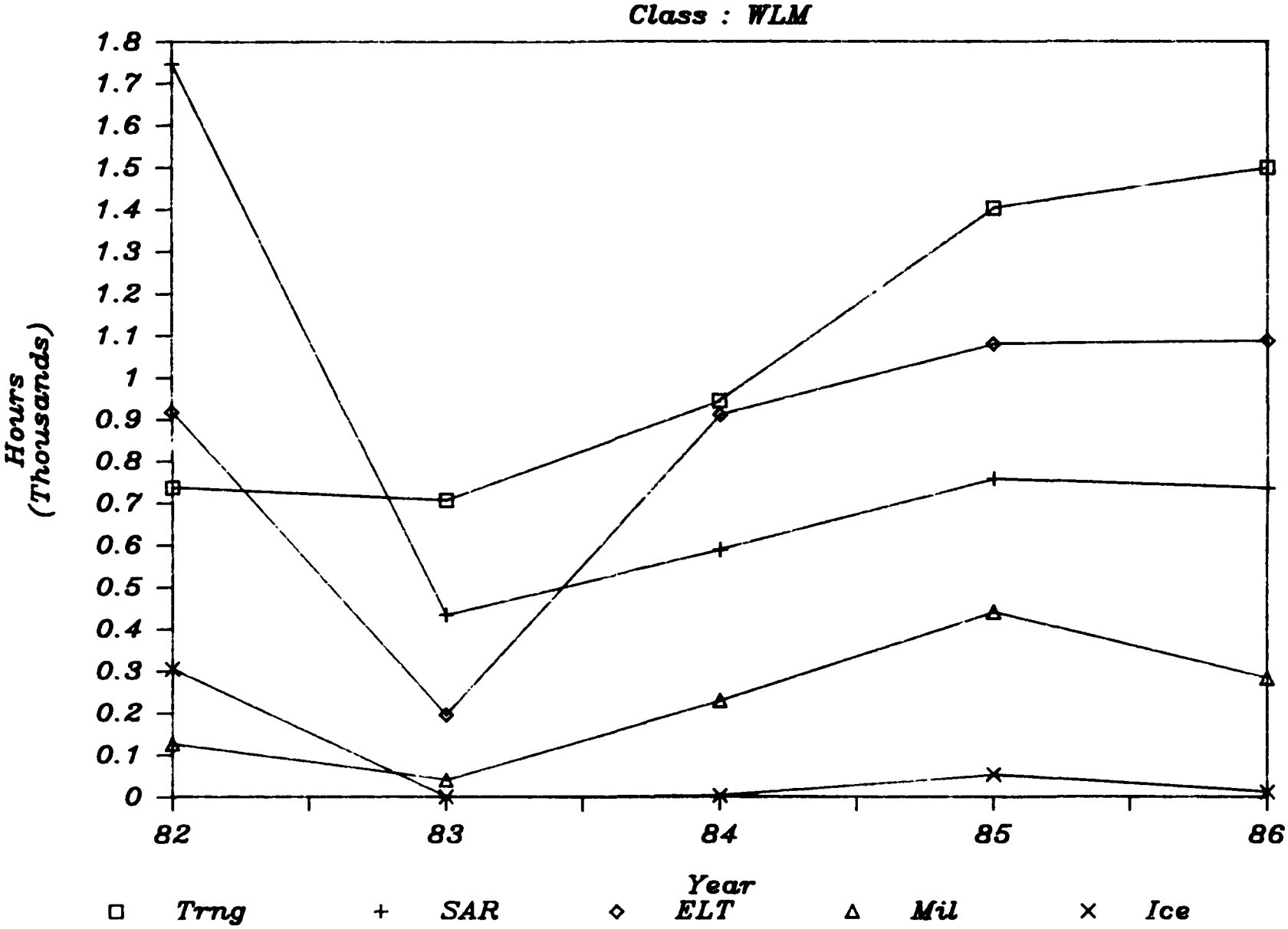
MISSION PROFILE 1982 – 1986



MISSION PROFILE 1982 – 1986



MISSION PROFILE 1982 – 1986



APPENDIX F

OPERATIONAL PROGRAM PLANS FY89-93

KEY: OPERATIONAL PROGRAMS

EBP - Support of Environmental Buoy Project
DIB - Domestic Icebreaking to Facilitate Navigation
CGIB - Icebreaking to Accomplish Coast Guard Mission
RFID - Reduce Flow of Illegal Drugs
DFSH - Domestic Fisheries
DEF - Defense Operations
SAR - Search and Rescue
ELAN - Maintain Electronic ATON System
SRAE - Evaluate Short Range Aid Systems
SRA - Maintain Short Range ATON System
PES - Port and Environmental Safety
IIP - International Ice Patrol

	Mission Program	Other			Dom Ice		ELT			Mil Ops	SAR	ATON			Ops Program
		EBP	IIP	PES	DIB	CGIB	RFID	DFSH	FFSH	DEF	SAR	ELAN	SRAB	SRA	TOTALS
	Dist.														
	1	10		0	10	5	0	98	0	6	0	0	10	256	395
	3	3	30*	3	0	0	0	48	0	6	0	0	0	195	255
	5	12		0	10	0	0	17	0	9	0	0	0	225	273
	7	9		0	0	0	348	0	0	6	0	0	0	250	613
WLB	8	18		0	0	0	50	0	0	6	0	0	0	166	240
	9	26		0	20	0	0	0	0	15	12	0	0	613	686
	11	3		0	0	0	53	0	0	3	0	0	0	90	149
	12	3		0	0	0	0	14	0	3	0	0	0	142	162
	13	0		0	0	0	0	29	0	3	0	0	0	108	140
	14	2		0	0	0	0	0	211	9	0	29	0	307	558
	17	22		0	0	0	0	168	0	18	0	0	0	676	884
PROGRAM TOTAL		108	30	3	40	5	451	374	211	84	12	29	10	3028	4385
MISSION TOTAL		141			45		1036			84	12	3067			4385
	1	0		0	0	0	18	0	0	6	0	0	0	485	509
	3	0		0	10	0	3	0	0	6	0	0	0	456	475
	5	0		0	10	0	1	0	0	4	0	0	0	366	381
	7	0		0	0	0	41	0	0	2	0	0	0	170	213
WLM	8	0		0	0	0	42	0	0	4	0	0	0	423	469
	9	0		0	0	0	0	0	0	0	0	0	0	0	0
	11	0		0	0	0	0	0	0	0	0	0	0	0	0
	12	0		0	0	0	0	0	0	0	0	0	0	0	0
	13	0		0	0	0	42	0	0	2	0	0	0	204	248
	17	0		0	0	0	0	0	0	0	0	0	0	0	0
PROGRAM TOTAL		0		0	20	0	147	0	0	24	0	0	0	2104	2295
MISSION TOTAL		0			20		147			24	0	2104			2295
GRAND TOTAL		141			65		1183			108	12	5171			6680

Required Cutter Days - FY89

* Atlantic Area

	Mission	Other			Dom Ice		ELT			Mil Ops	SAR	ATON			Ops Program
	Program	EBP	IIP	PES	DIB	CGIB	RFID	DFSH	FFSH	DEF	SAR	ELAN	SRAE	SRA	TOTALS
	Dist.														
	1	10		0	10	5	0	98	0	6	0	0	10	252	391
	3	3	30*	3	0	0	0	48	0	6	0	0	0	191	252
	5	12		0	10	0	0	17	0	9	0	15	0	221	284
	7	9		0	0	0	348	0	0	6	0	0	0	246	609
WLB	8	18		0	0	0	50	0	0	6	0	0	0	164	238
	9	26		0	20	0	0	0	0	15	12	0	0	604	677
	11	3		0	0	0	53	0	0	3	0	0	0	89	148
	12	3		0	0	0	0	14	0	3	0	0	0	140	160
	13	0		0	0	0	0	29	0	3	0	0	0	106	138
	14	2		0	0	0	0	0	211	9	0	29	0	303	554
	17	22		0	0	0	0	168	0	18	0	0	0	666	874
PROGRAM TOTAL		108	30	3	40	5	451	374	211	84	12	44	10	2983	4355
MISSION TOTAL		141			45		1036			84	12	3037			4355
	1	0		0	0	0	18	0	0	6	0	0	0	478	502
	3	0		0	10	0	3	0	0	6	0	0	0	449	468
	5	0		0	10	0	1	0	0	4	0	0	0	361	376
	7	0		0	0	0	41	0	0	2	0	0	0	168	211
WLM	8	0		0	0	0	42	0	0	4	0	0	0	417	463
	9	0		0	0	0	0	0	0	0	0	0	0	0	0
	11	0		0	0	0	0	0	0	0	0	0	0	0	0
	12	0		0	0	0	0	0	0	0	0	0	0	0	0
	13	0		0	0	0	42	0	0	2	0	0	0	201	245
	17	0		0	0	0	0	0	0	0	0	0	0	0	0
PROGRAM TOTAL		0		0	20	0	147	0	0	24	0	0	0	2074	2265
MISSION TOTAL		0			20		147			24	0	2074			2265
GRAND TOTAL		141			65		1183			108	12	5111			6620

Required Cutter Days - FY90

* Atlantic Area

Mission Program		Other EBP	Other IIP	Other PES	Dom Ice DIB	Dom Ice CGIB	ELT RFID	ELT DFSH	ELT FFSH	Mil Ops DEF	SAR SAR	ATON ELAN	ATON SRAE	ATON SRA	Ops Program TOTALS
	Dist.														
	1	10		0	10	5	0	98	0	6	0	0	10	248	387
	3	3	30*	3	0	0	0	48	0	6	0	0	0	189	249
	5	12		0	10	0	0	17	0	9	0	15	0	217	280
	7	9		0	0	0	348	0	0	6	0	0	0	242	605
WLB	8	18		0	0	0	50	0	0	6	0	0	0	162	236
	9	26		0	20	0	0	0	0	15	12	0	0	595	668
	11	3		0	0	0	53	0	0	3	0	0	0	88	147
	12	3		0	0	0	0	14	0	3	0	0	0	138	158
	13	0		0	0	0	0	29	0	3	0	0	0	104	136
	14	2		0	0	0	0	0	211	9	0	29	0	299	550
	17	22		0	0	0	0	168	0	18	0	0	0	656	864
PROGRAM TOTAL		108		3	40	5	451	374	211	84	12	44	10	2938	4310
MISSION TOTAL		141			45		1036			84	12	2992			4310
	1	0		0	0	0	18	0	0	6	0	0	0	471	495
	3	0		0	10	0	3	0	0	6	0	0	0	442	461
	5	0		0	10	0	1	0	0	4	0	0	0	356	371
	7	0		0	0	0	41	0	0	2	0	0	0	166	209
WLM	8	0		0	0	0	42	0	0	4	0	0	0	411	457
	9	0		0	0	0	0	0	0	0	0	0	0	0	0
	11	0		0	0	0	0	0	0	0	0	0	0	0	0
	12	0		0	0	0	0	0	0	0	0	0	0	0	0
	13	0		0	0	0	42	0	0	2	0	0	0	198	242
	17	0		0	0	0	0	0	0	0	0	0	0	0	0
PROGRAM TOTAL		0		0	20	0	147	0	0	24	0	0	0	2044	2235
MISSION TOTAL		0			20		147			24	0	2044			2235
GRAND TOTAL		141			65		1183			108	12	5036			6545

Required Cutter Days - FY91

* Atlantic Area

	Mission	Other			Dom Ice		ELT			Mil Ops	SAR	ATON			Ops Program
	Program	EBP	IIP	PES	DIB	CGIB	RPID	DPSH	FPSH	DEP	SAR	ELAN	SRAE	SRA	TOTALS
	Dist.														
	1	10		0	10	5	0	98	0	6	0	0	10	244	383
	3	3	30*	3	0	0	0	48	0	6	0	0	0	186	246
	5	12		0	10	0	0	17	0	9	0	15	0	213	276
	7	9		0	0	0	348	0	0	6	0	0	0	238	601
WLB	8	18		0	0	0	50	0	0	6	0	0	0	160	234
	9	26		0	20	0	0	0	0	15	12	0	0	586	659
	11	3		0	0	0	53	0	0	3	0	0	0	87	146
	12	3		0	0	0	0	14	0	3	0	0	0	136	156
	13	0		0	0	0	0	29	0	3	0	0	0	102	134
	14	2		0	0	0	0	0	211	9	0	29	0	245	546
	17	22		0	0	0	0	168	0	18	0	0	0	646	854
PROGRAM TOTAL		108		3	40	5	451	374	211	84	12	44	10	2893	4265
MISSION TOTAL		141			45		1036			84	12	2947			4265
	1	0		0	0	0	18	0	0	6	0	0	0	464	488
	3	0		0	10	0	3	0	0	6	0	0	0	435	454
	5	0		0	10	0	1	0	0	4	0	0	0	351	366
	7	0		0	0	0	41	0	0	2	0	0	0	164	207
WLM	8	0		0	0	0	42	0	0	4	0	0	0	405	451
	9	0		0	0	0	0	0	0	0	0	0	0	0	0
	11	0		0	0	0	0	0	0	0	0	0	0	0	0
	12	0		0	0	0	0	0	0	0	0	0	0	0	0
	13	0		0	0	0	42	0	0	2	0	0	0	195	239
	17	0		0	0	0	0	0	0	0	0	0	0	0	0
PROGRAM TOTAL		0		0	20	0	147	0	0	24	0	0	0	2014	2205
MISSION TOTAL		0			20		147			24	0	2014			2205
GRAND TOTAL		141			65		1183			108	12	4961			6470

Required Cutter Days - FY92

* Atlantic Area

Mission Program		Other			Dom Ice		ELT			Mil Ops	SAR	ATON			Ops Program
	Dist.	EBP	IIP	PES	DIB	CGIB	RFID	DFSH	FFSH	DEF	SAR	ELAN	SRAE	SRA	TOTALS
	1	10		0	10	5	0	98	0	6	0	0	10	240	379
	3	3	30*	3	0	0	0	48	0	6	0	0	0	183	243
	5	12		0	10	0	0	17	0	9	0	15	0	209	272
	7	9		0	0	0	348	0	0	6	0	0	0	234	597
WLB	8	18		0	0	0	50	0	0	6	0	0	0	158	232
	9	26		0	20	0	0	0	0	15	12	0	0	577	650
	11	3		0	0	0	53	0	0	3	0	0	0	86	145
	12	3		0	0	0	0	14	0	3	0	0	0	134	154
	13	0		0	0	0	0	29	0	3	0	0	0	100	132
	14	2		0	0	0	0	0	211	9	0	29	0	291	542
	17	22		0	0	0	0	168	0	18	0	0	0	636	844
PROGRAM TOTAL		108		3	40	5	451	374	211	84	12	44	10	2848	4220
MISSION TOTAL		141			45		1036			84	12	2902			4220
	1	0		0	0	0	18	0	0	6	0	0	0	457	481
	3	0		0	10	0	3	0	0	6	0	0	0	428	447
	5	0		0	10	0	1	0	0	4	0	0	0	346	361
	7	0		0	0	0	41	0	0	2	0	0	0	162	205
WLM	8	0		0	0	0	42	0	0	4	0	0	0	399	445
	9	0		0	0	0	0	0	0	0	0	0	0	0	0
	11	0		0	0	0	0	0	0	0	0	0	0	0	0
	12	0		0	0	0	0	0	0	0	0	0	0	0	0
	13	0		0	0	0	42	0	0	2	0	0	0	192	236
	17	0		0	0	0	0	0	0	0	0	0	0	0	0
PROGRAM TOTAL		0		0	20	0	147	0	0	24	0	0	0	1984	2175
MISSION TOTAL		0			20		147			24	0	1984			2175
GRAND TOTAL		141			65		1183			108	12	4886			6395

Required Cutter Days - FY93

* Atlantic Area

APPENDIX G

DEFENSE OPERATIONS REQUIRING WLBs

Defense Requirements

Requirements for Defense Operations and Naval Warfare missions by Coast Guard resources and assets are as follows, in order of priority (8):

Naval Force Movements

Protection of Naval Forces in Port (CONUS)

Military Deployments (Facilities and Vessels)

Reinforcement and Resupply in Forward Areas (Facilities and Vessels)

Protection of Key Assets and Other Select Facilities and Operations (e.g. Shuttle Launch)

Protection of Selected Offshore Assets (e.g. LOOP)

Protection of Critical Waterborne Commerce

Protection of General Waterborne Commerce

Protection of Offshore Assets-General

From the list of requirements for defense operations, a list of missions and tasks specific to WLBs is developed. There is a wide variety of potential naval warfare roles and missions a WLB/WLM could be called upon to perform by an operational commander. The versatility of the existing vessels provides some

degree of capability for these vessels to perform or support these missions. The mine countermeasures mission is the only approved Naval Warfare mission for WLBs with formal tasking provided by the Memorandum of Understanding (14). The remaining missions are a conjecture of possible uses of WLBs in a Naval Warfare environment as gathered from various sources. The missions may be classified as Naval Warefare Missions or Extensions of Coast Guard Missions in wartime.

A. NAVAL WARFARE MISSIONS

Mine Countermeasures

Mine Countermeasures is the only mission specifically designated for WLBs by the updated Memorandum of Agreement. Mine Countermeasures includes Q-Route Survey, COOP Operations and Mine Clearance Command Vessel functions. Q-Routes are precisely designated but unmarked entrance channels to selected ports that are continuously swept by bottom-imaging sonar to ensure that hostile mines have not been placed in them. This activity requires a highly accurate navigation system, a high-resolution sonar, and a system to record and analyze the bottom image data. COOPs are craft-of-opportunity that are previously designated and equipped with a modular side-scan sonar to assist minesweepers in Q-Route Survey, and mine detection.

There is an annual commitment of 120 WLB cutter days to Q-route survey (14). In tests conducted by Commander, Mine Warfare Command (COMMINEWARCOM) with USCGC PAPAW using commercially available side-scan sonar, it was determined that the present fleet of WLBs and WLMs has the seakeeping qualities, sufficient working space and appropriate billets necessary to accomplish the manual navigation method of route survey as a secondary mission (4). WLBs will not be directly involved in mine clearance but can function as a command post to coordinate minesweeper and COOP vessel operations. Recent experience in Exercise SOLID SHIELD demonstrated that this function requires a sophisticated command

and communication capability similar to the Command Display and Control (COMDAC) System on 270ft Medium Endurance Cutters (19). Channel conditioning and defensive minelaying are related functions in which WLBs can be employed. These functions primarily support the Naval Force Movement, Protection of Naval Forces in Port and Reinforcement and Resupply requirements.

Port Breakout

This is the sortie of a military deployment force from a port that may be mined. This operation entails mine countermeasures in order to ensure that the exit route is clear, and escort of vessels through the swept channel. The escort vessel requires precision navigation and high-level command and control capabilities.

Harbor Defense

These operations entail support of Naval Mobile Inshore Undersea Warfare (MIUW) units, harbor entrance patrols, and placement of fixed underwater sonar arrays used for swimmer detection. MIUWs are naval reserve units that are self-contained harbor and coastal surveillance organizations that can detect hostile intrusions and alert interdicting forces. Some scenarios have MIUWs embarked in WLBs. Previous experience with swimmer detection sonar arrays demonstrated the requirement for placement of bulky structures on the harbor bottom.

Harbor Clearance and Salvage

Harbor clearance entails explosive ordnance disposal (EOD) and removal of underwater obstacles by lifting, dragging or demolition. Salvage of aircraft, boats and ships entails fighting fires, patching, dewatering and providing electrical power to other vessels as well as towing and handling of weights. Recovery of military cargoes, on a sunken or disabled vessel may also be required. Channel conditioning is removing mine-like

objects from Q-routes and harbors in order to enhance detection of actual mines. These functions make extensive use of divers and/or underwater vehicles. WLBs are excellent platforms for supporting underwater operations due to their large deck area and weight handling capabilities.

Defensive Mine Laying

This mission involves installation of defensive mine fields in U.S. controlled ports. It requires precision navigation, space and weight capacity for mines and minerals.

Naval Control of Shipping Support

This involves rerouting shipping from Naval operating and contested areas and control, inspection and protection of commercial shipping, including fishing vessels. This is similar to "Operation Marketime" in Vietnam. This is not a primary task for WLBs.

Amphibious Support and Resupply

WLBs may be utilized to transport amphibious landing craft to forward areas and to lighter cargo ashore in ports of limited capacity.

B. EXTENSION OF COAST GUARD MISSIONS IN WARTIME

Military Aids-to-Navigation

This task is an extension of the buoy tenders' primary peacetime mission. It requires installation and maintenance of aids-to-navigation in ports of debarkation in CONUS and forward areas. WLBs were employed for this task in Vietnam. This task is of primary importance to the Naval Force Movements, Military Deployment, Reinforcement and Resupply, and Critical Waterborne Commerce requirements.

Icebreaking

Current naval strategy requires operation in northern ports in forward areas. Resupply and military ATON tasks require icebreaking consistent with present capabilities (7). Icebreaking ability for 1-2 feet of hard ice is desirable for operation in the northern portion of the Great Lakes (17).

Combat SAR

This function entails search and rescue of personnel, aircraft, and vessels as a result of military actions. This requires command and control, moderate speed and light defensive capabilities against hostile aircraft.

Surveillance and Interdiction

WLBs are presently employed in drug interdiction missions and can perform a similar function in defense operations. They can be used for surveillance, however their interdiction capability in naval warfare is limited by their maximum speed and limited armament (18). They have been used as support vessels and tenders for patrol craft divisions in forward areas.

C. REQUIRED CHARACTERISTICS OF WLBs FOR MILITARY TASKS

Required capabilities from all sources surveyed were utilized to develop vessel and outfit characteristics.

Vessel Characteristics

The vessel should have sufficient stability and seaworthiness for deployment to overseas ports of debarkation. Operation in northern ports in forward areas will require northern ocean transit in winter. Transit should not be severely degraded in sea state 5. The vessel should be at least capable of ATON work in sea state 3 as are present WLBs.

The vessel should be capable of full hull speed. 15 kts is desirable for the lead-out function (7). Operation with an amphibious task group requires sustained speed of 18 kts and a maximum of 20 kts(6). Channel conditioning and Q-route surveys require accurate controllability at sustained slow speeds from zero to three knots, and a high speed capability for transitting to operational areas (4).

The vessel should be capable of unreplenished endurance of 15 days. It should be able to accept replenishment underway via aircraft or another vessel. With replenishment maximum underway period should be 30 days (5).

The mothership function for patrol craft requires sustained spartan accommodations for 50 additional personnel or temporary berthing for 80 troops for intra-theater transportation (6). Mine countermeasures command function requires 3 officers and 6 enlisted personnel in addition to ships company, plus dedicated command center space of 15 X 20 ft (7). This space can also be used as a Q-route survey center which can be accomplished by ship's company (4).

The vessel should have the cargo capacity and deck area of the present WLB as a minimum (21). Sufficient stability is required to carry loads up to 50 tons of buoys, vehicles, boats, and mines, with load centered up to three feet off the deck. The cargo deck should be at least 45 feet in length. The vessel should have the space and weight capacity for two LCPLs, mini-ATCs, or SEA Fox boats (6).

The vessel should have a crane capable of launching and retrieving small amphibious landing craft, mine countermeasures craft and survey craft in order to support amphibious and mine countermeasures missions. Mini-ATCs have a hoisting weight of 25,600 lbs in slings. WLBs were originally designed to have a 30 ton lifting capacity, but have subsequently been derated to 20 tons.

A configuration similar to Navy salvage vessels has been proposed (7) with small modification in deck and weight handling capabilities. The seakeeping capability and volume capacity of a SWATH configuration is attractive, however a 50 ton payload is difficult to achieve in a small waterplane hull. Features required for multimission tasks should be "built-in" and not modularized.

Controllability at both maximum and minimum speeds may require controllable pitch propellers and/or twin screws and thrusters, depending on hull configuration.

Additional vessel characteristics required for military tasks include the following:

- A positive ventilation system which provides positive internal air pressure to prevent entry of unprocessed air (to Navy standards).
- The ability to provide fuel to WPBs by astern refueling.
- The ability to receive high priority cargo by vertical replenishment.

Outfit Characteristics

Interoperability with U.S. Naval forces is required. Secure communications and command and control compatibility is essential. As a minimum 2 secure HF, 2 secure UHF, 2 secure VHF, secure RATT and SATCOM capabilities are required (7). Additional channels include flashing light, flag hoist and NANCY to enable accompanied operations (6). COMDAC is highly desirable for mine countermeasures command functions.

A precision navigation capability which is compatible with Navy minesweeping systems and standards is required (6). Q-route survey requires 20 yard accuracy in U.S. ports. This is within

the measured accuracy of a Differential LORAN-C System. U.S. Navy presently uses Hyperfix(4). Precise navigation systems are vital for successful execution of Q-route surveys and ATON system management (14).

Q-route survey also requires side-scan sonar with the necessary cable winches on the fantail. A sonar capable of classifying and targeting a mini-sub, swimmer delivery vehicle, or minelaying conventional sub in shallow water to 600 feet depth would be desirable for port security and harbor defense (6). The vessel should be capable of detecting surface targets with minimal radar cross section using IR or LLLTV system (6). Surface search radar and a high intensity searchlight are required.

Redundant weapons systems capable of forcibly halting a medium size merchant vessel attempting to force harbor entrance are required. Candidate systems in order of preference are:

1. 76mm Mk 75 gun aft and Phalanx CIWS, with two simple optronic fire control systems including secondary control for Phalanx.

2. Two EX-83 mounts, with fire control systems as above. Weapon systems as planned for "Special Warfare Craft, Medium", two 25mm Sea Vulcan and optronic fire control.

3. Two Emerlec twin 30mm mounts under local control.

4. Hughes M242 "Bushmaster" 25mm chain guns arranged to allow at least two guns to fire on any bearing.

5. Self defense capability against aircraft such as Stinger missile or AAW capable fire control system (6).

6. Alternative weapons systems which are smaller and lighter are a short range surface to surface missile such as the PENGUIN which would provide missile support to the horizon and a 40mm gun system which is not presently in the U.S. inventory (17).

7. The Mission Needs Statement requires 50 cal. machine guns in peacetime (18).

Additional outfit characteristics required for military tasks include:

- Degaussing- Adequate to U.S. Navy standards for combatant vessels

- Gas-tight envelope/washdown system- Adequate to standards for atomic, biological and chemical warfare

- Diving locker- Adequate to U.S. Navy standards

APPENDIX H

LIST OF INTERVIEWS

The following people were interviewed and provided input on the subject of buoy tender utilization. Time constraints did not allow visits to all districts, so as large a cross-section as possible was sampled. In addition to insight on the Abstracts of Operations which was used as the primary historical data base, they shared their ideas on future use of buoy tenders, and overall impressions of the manner in which the Coast Guard might operate the buoy tender fleet in the future. In addition, Headquarters staff members in G-NSR and G-OP assisted by providing mission usage information. The authors wish to express their appreciation to all those who supported this effort.

District	and Date	Attendees
1	10/29/86	LCDR W.D. Kline, CO, CGC BITTERSWEET LT T. Allen, XO, CGC BITTERSWEET
1	10/16/86	CAPT S. Richmond, Chief (oan) CDR C. Montanese, Asst. Chief, (oan) LTJG B. Clough, Ops Officer LTJG M. Haydin, Asst. Ops Officer
3	10/9/86	LCDR J. Murray, Deputy Group Commander, Group Long Island Sound
3	10/23/86	LT J. Brooks, CO, CGC REDWOOD
7	11/6/86	CAPT T. Nutting, Chief (oan) LCDR J. O'Shea, Asst. Chief (oan) LTJG R. Sharrer LTJG P. Centonze
8	11/7/86	CAPT D. Carey, Chief (oan) LCDR W. Southwood, Ops Officer
12	11/18/86	CDR S. Romo, Chief (oan) CDR J. Cushman, CO (VTS) CDR W. Clark, Chief, (oil) CDR M. Costello, Asst. Chief (osr) LT J. Way, Asst. Chief (oan)
13	11/19/86	CDR R. Parsons, Chief (oan) LT P. Stephenson, Ops Officer
17	11/20/86	CDR J.S. Merrill, Chief (oan) Mr. R. Seagrave, Asst. Chief (oan)
HQ	9/30/86	CDR D. Jones, Chief, Facility Management Branch (G-NSR-2) CDR C. Bell, Chief, Navigation Safety System (G-NSS) LCDR C. Lancaster (G-NSR-2) LCDR C. Marple (G-OP-1) Mr. P. D'Zmura, Chief (G-OP-1) LT J. Tuttle (G-APM/w1)

END

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